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NOTS TP 4143
Part 3

STORAGE TEMPERATURE OF EXPLOSIVE HAZARD MAGAZINES

Part 3. OKINAWA AND JAPAN

by

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Propulsion Development Department

AD822040

ABSTRACT. Storage magazine temperature measurements (32,548 data points) from Okinawa and Japan are under study. This data collection is for the purpose of establishing a temperature criterion by statistical methods for ordnance stored in explosive hazard magazines.

This report is the third of the series of reports which will cover explosive hazard magazine storage throughout the world. This report includes 30 figures and 14 tables.

U.S. NAVAL ORDNANCE TEST STATION
China Lake, California June 1967

U. S. NAVAL ORDNANCE TEST STATION
AN ACTIVITY OF THE NAVAL MATERIAL COMMAND
G. H. LOWE, CAPT., USN — Commander
WM. B. McLEAN, PH.D. — Technical Director

FOREWORD

This report is a continuation of the work covered in TP 4143, Part 1, American Desert and Part 2, Western Pacific. The effort described herein was undertaken by the U. S. Naval Ordnance Test Station (NOTS), China Lake, California, to determine the valid temperature environment of ordnance stored in "explosive hazard magazines" located in Okinawa and Japan.

It is expected that there will be sufficient interest generated among ordnance designers to warrant continued work in the study of storage temperatures in other areas of interest such as marine-induced arctic, etc. This is the third in a series of reports.

This work was supported by Task Assignment Number A33-536-711/216-1/F009-06-01.

This report has been reviewed for technical accuracy by Warren W. Oshel.

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Special acknowledgement is due Mrs. Ruth Massaro, who has generated via computer equipment, the pertinent graphs and statistics presented in this report.

CONTENTS

INTRODUCTION

Environmental temperature criteria are a major controlling factor in the design of all types of ordnance. However, the accepted temperature criteria, as set forth in Military Specifications, may be such that there are ordnance that actually meet the needs of our Naval services and yet have failed over-strenuous qualification requirements. It is important then, that the actual temperature environment of ordnance be studied to substantiate existing temperature specifications or to revise the limitations in accordance with the true findings.

SCOPE

This report covers a comparatively small area of the storage environment of explosive ordnance. Storage temperatures (data points) were obtained from Naval facilities located in Okinawa and Japan in order to study temperatures within storage magazines. These data points were obtained by the personnel at the Naval Air Facility (NAF), Naha, Okinawa; the Naval Ordnance Facility (NOF), Sasebo, Japan; the Marine Corps Air Station (MCAS), Iwakuni, Japan; the Naval Air Station (NAS), Atsugi, Japan; and the Naval Ordnance Facility (NOF), Yokosuka, Japan, for use in their ammunition safety programs.

The data reported herein are comprised of the measured air temperatures inside the described structures only. Any ordnance stored in these structures cannot be expected to thermally follow the variations in temperature of the enclosed air. The difference in mass between the two can be expected to prevent this. Therefore, any temperature herein reported can be treated as "conservative" for ordnance stored in these explosive hazard magazines.

BACKGROUND

This study in magazine temperature is the third of the series which will cover worldwide storage magazine temperatures. Part 1 covered the desert regions of the Western United States; Part 2, the tropics of the Western Pacific. As is true with temperature data from storage magazines from the desert and tropics, data from Okinawa and Japan are available because of the requirements set forth in the Navy Bureau of Ordnance Publication, OP5, Ammunition Ashore, Handling, Storing and Shipping, which defines a requirement for the maintenance of magazine air maximum and minimum temperature records.

INSTRUMENTATION

The magazine temperature data were obtained through the use of "horseshoe" maximum and minimum mercury thermometers. These thermometers are equipped with steel "tattletale" devices that float on the mercury and remain at the highest and lowest temperature positions reached during the measurement period. The ordnance men reset the tattletales with a magnet after reading the indicated maximum and minimum temperature for the measurement period. The manufacturers of the thermometers (Taylor, Weksler, Moeller) warrant that the temperature readings are accurate to within 2°F at the time of delivery to the Navy. These thermometers are mounted on the inside forward face or the back wall of the explosive hazard magazines at about eye level (standard procedure).

The non-standard magazines such as tunnels, may not allow the placement of the thermometers at the standard locations within the magazine. Thermometers have been observed to be mounted on boards, or even bare, and situated for convenience even in standard types of magazines.

METHOD OF DATA RETRIEVAL AND REDUCTION

All available storage magazine temperature data from the NAF, Naha, Okinawa; NOF, Sasebo, Japan; MCAS, Iwakuni, Japan; NAS, Atsugi, Japan; and NOF, Yokosuka, Japan, were collected and sent to the Analysis Branch, Propulsion Development Department at NOTS, China Lake, California. The raw data were reduced to meaningful statistics. The significant points of interest for each location were tabulated. These were (1) the number of temperature measurements collected, (2) the number of measured temperatures exceeding 90°F for each month, and (3) the average maximum and the average minimum temperature for each month.

The raw data input consisted of summary sheets of the maximum and minimum temperatures organized by magazine area, magazine type and the date of the readings. The information on the summary sheets was transferred to IBM punchcards. A computer was then used to reduce the information into the statistics previously mentioned. The steps by which the raw data were processed are explained in detail in Appendix A.

RESULTS

A summarization of the data points exceeding 90°F and 100°F from both earth-covered and non-earth-covered magazines for storage magazines located in Okinawa and Japan is presented in Table 1.

The results presented in Table 1 give an indication of temperatures to be expected from explosive hazard magazines in Okinawa and Japan. It must be remembered, however, that the apparent differences in temperature between locations is, to some extent, due to the construction of the individual storage magazines. (The descriptions of the magazine classifications pertinent to this report are given in Appendix B.)

TABLE 1. Data Summary by Station and Magazine Type.

Storage Locations	Magazine Type	Years[a]	N[b]	No. of Maximum Temperatures Greater Than or Equal to		Maximum Recorded Temperature
				90°F	100°F	
Naval Air Facility Naha, Okinawa	Earth-covered	3	503	45	1	107
	Non-earth-covered	3	566	181	6	105
Naval Ordnance Facility Sasebo, Japan	Earth-covered	4	296	0	0	84
	Non-earth-covered	1	352	18	2	100
Marine Corps Air Station Iwakuni, Japan	Earth-covered	3	2680	133	33	114
	Non-earth-covered	3	929	157	20	117
Naval Air Station Atsugi, Japan	Earth-covered	1	907	6	1	100
	Non-earth-covered	4	4961	183	0	99
Naval Ordnance Facility Yokosuka, Japan	Earth-covered	1	1879	3	0	90
	Non-earth-covered	1	825	32	0	96

[a]Length of time in complete calendar years.

[b]Number of data points represented in the sample.

The average maximum and minimum temperatures of each month for the five magazine sites are shown in Fig. 1 through 11. Figures 1, 4, 6, 8, and 10 are the data reported from earth-covered explosive hazard magazines at these various locations. Figures 2, 5, 7, 9, and 11 are the data reported from the non-earth-covered magazines. The upper lines in Fig. 1 through 11 represent the monthly observed average maximums and the lower lines represent the observed average minimums.

Figures 1 and 2 include the years 1 January 1964 through 31 December 1966, for the Naval Air Facility, Naha, Okinawa.

Figure 3 includes the years April 1962 through December 1965 for the Naval Ordnance Facility, Sasebo, Japan. This plot includes temperature data from both earth-covered and non-earth-covered magazines; the temperature data had not been identified with magazines.

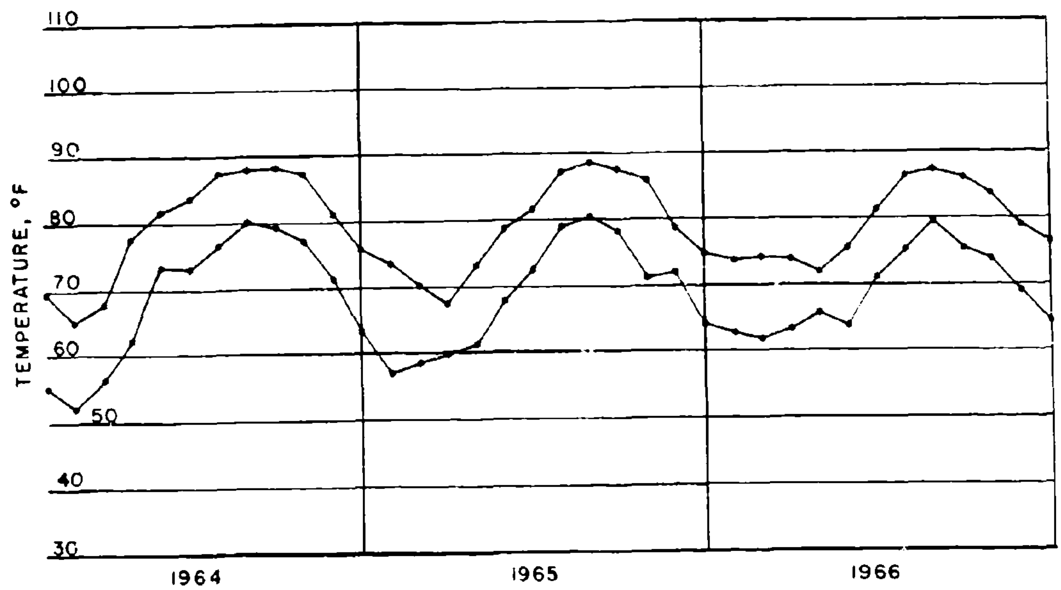

FIG. 1. The Average Maximum and Average Minimum Temperatures of Earth-Covered Magazines at the NAF, Naha, Okinawa.

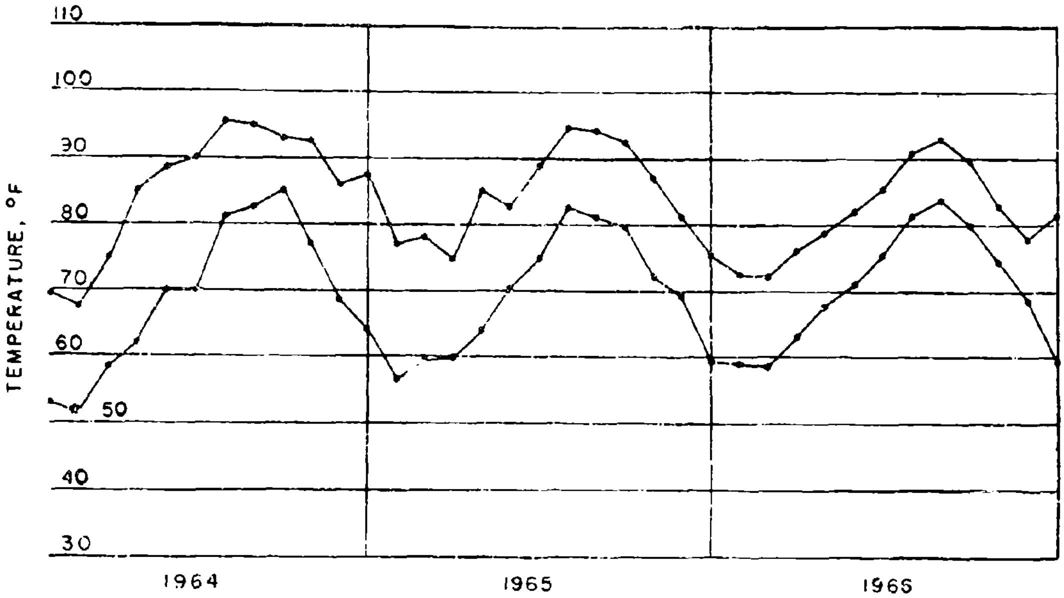

FIG. 2. The Average Maximum and Average Minimum Temperatures of Non-Earth-Covered Magazines at the NAF, Naha, Okinawa.

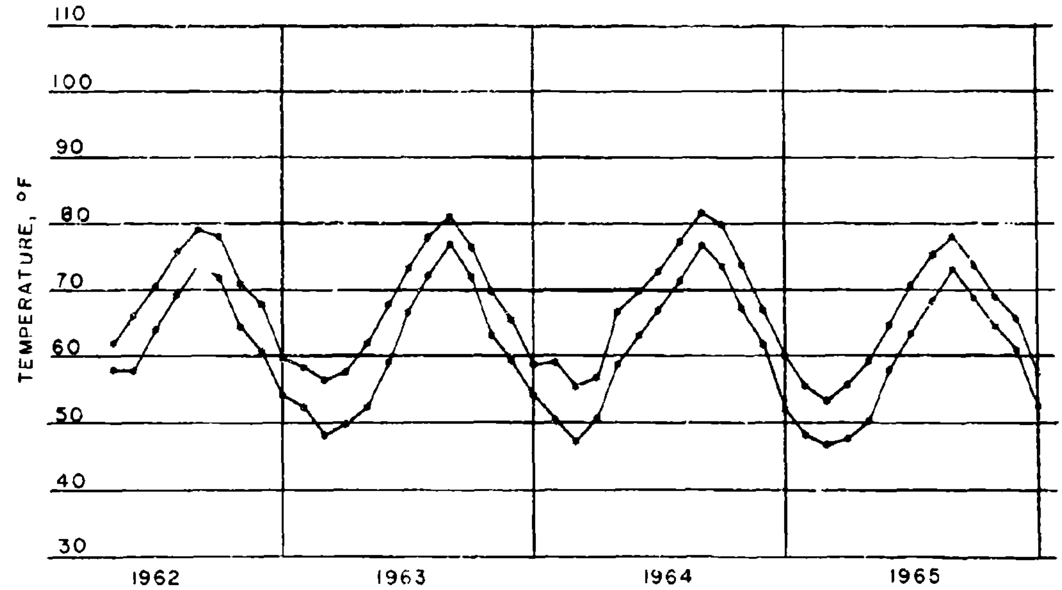

FIG. 3. The Average Maximum and Average Minimum Temperatures of Magazines at the NOF, Sasebo, Japan.

Figures 4 and 5 cover the year of 1966 for the Naval Ordnance Facility, Sasebo, Japan. These figures are the separated extension of Fig. 3.

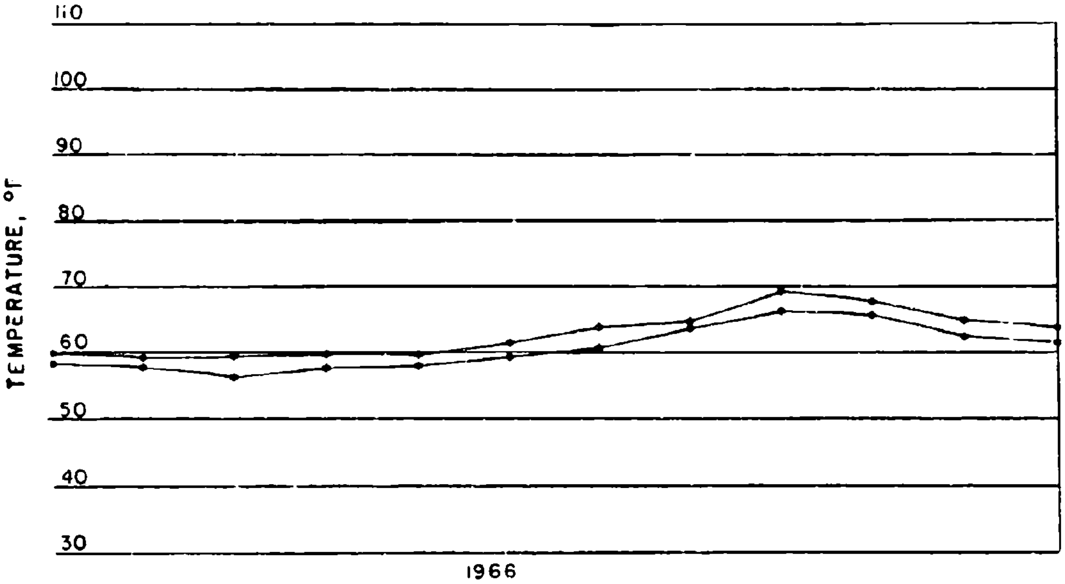

FIG. 4. The Average Maximum and Average Minimum Temperatures of Earth-Covered Magazines at the NOF, Sasebo, Japan.

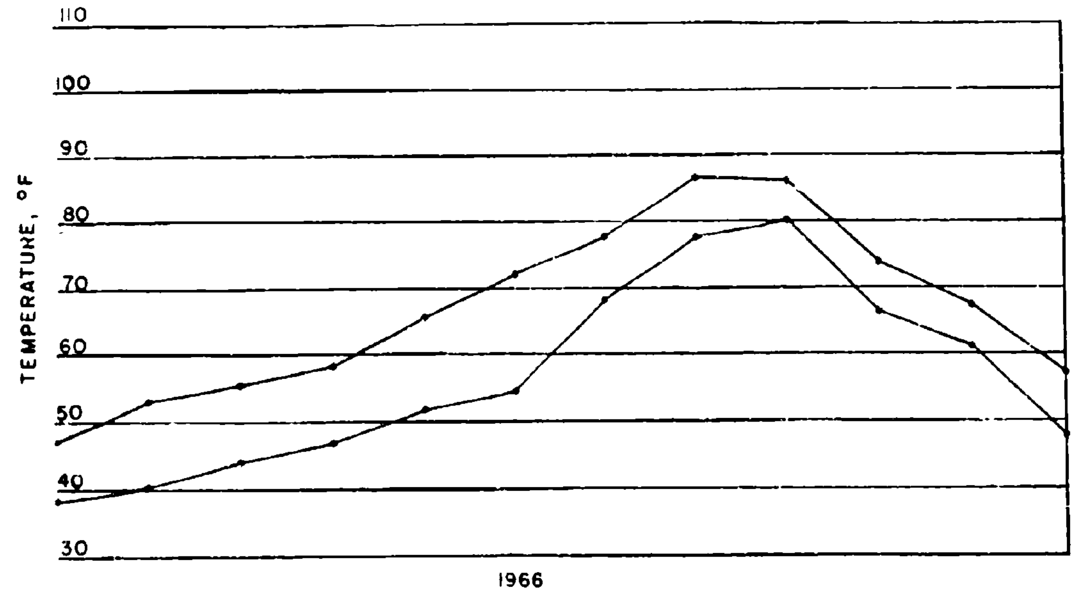

FIG. 5. The Average Maximum and Average Minimum Temperatures of Non-Earth-Covered Magazines at the NOF, Sasebo, Japan.

Figures 6 and 7 include the years July 1963 through December 1966 for the Marine Corps Air Station, Iwakuni, Japan.

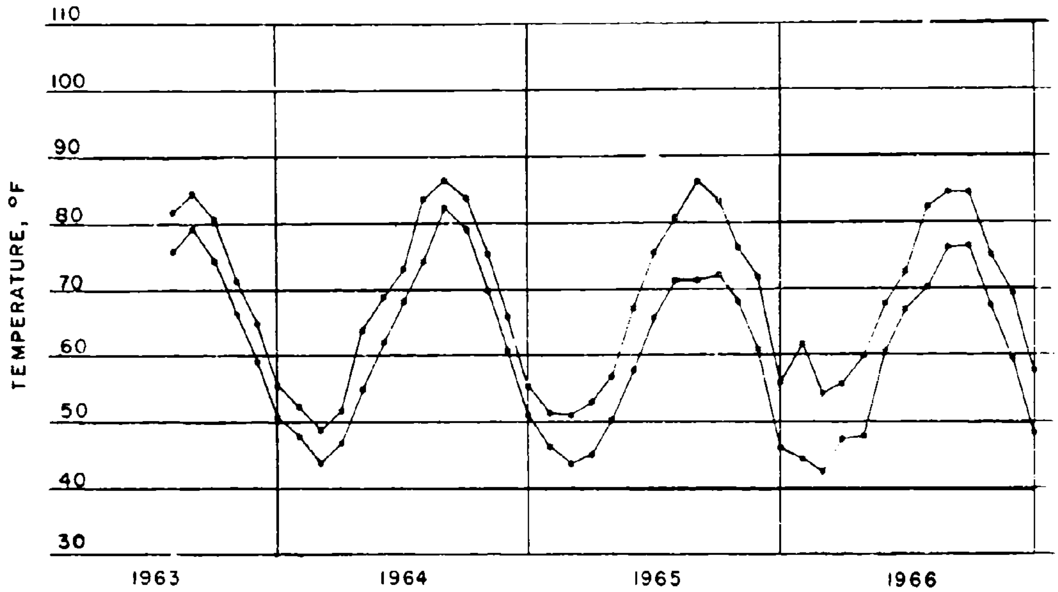

FIG. 6. The Average Maximum and Average Minimum Temperatures of Earth-Covered Magazines at the Marine Corps Air Station, Iwakuni, Japan.

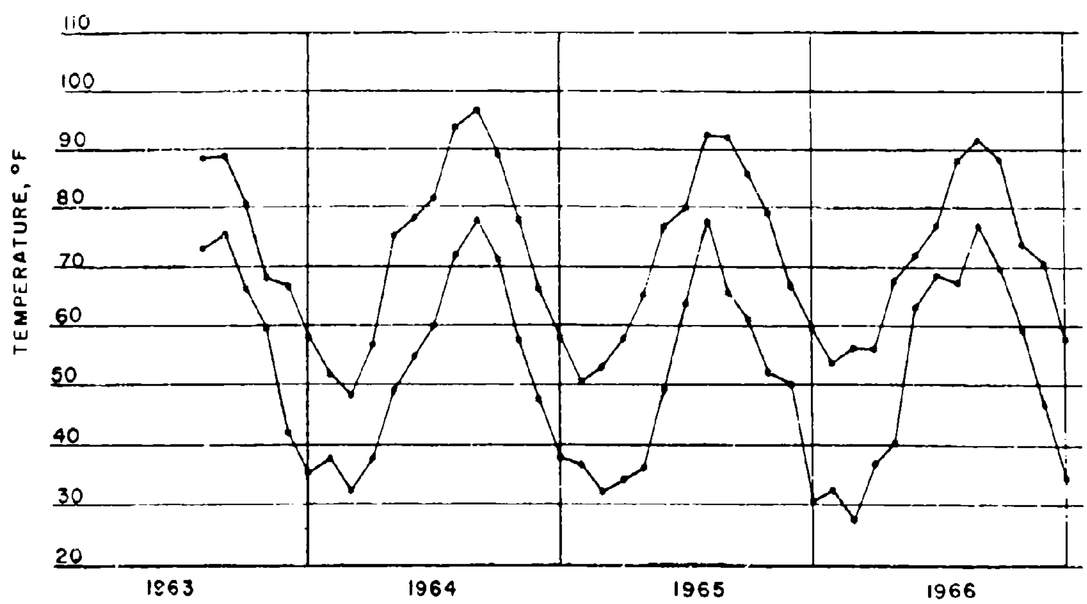

FIG. 7. The Average Maximum and Average Minimum Temperatures of Non-Earth-Covered Magazines at the Marine Corps Air Station, Iwakuni, Japan.

Figure 8 includes the years March 1965 through December 1966 for earth-covered magazines at the Naval Air Station, Atsugi, Japan.

Figure 9 includes the years June 1961 through March 1964 and March 1965 through December 1966, for non-earth-covered magazines at the Naval Air Station, Atsugi, Japan.

Figures 10 and 11 cover the year of 1966 for the Naval Ordnance Facility, Yokosuka, Japan.

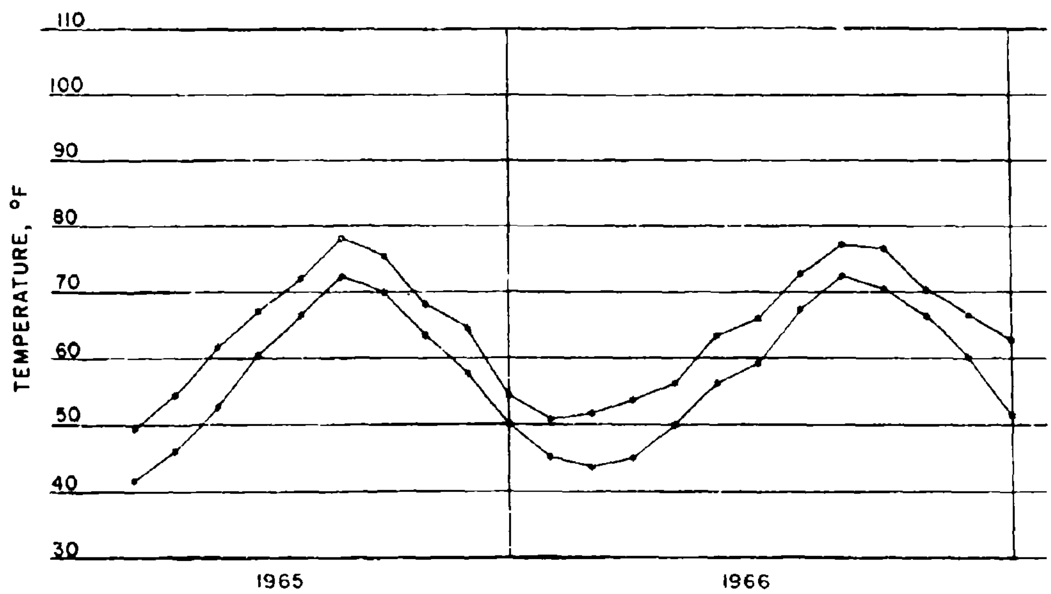

FIG. 8. The Average Maximum and Average Minimum Temperatures of Earth-Covered Magazines at the Naval Air Station, Atsugi, Japan.

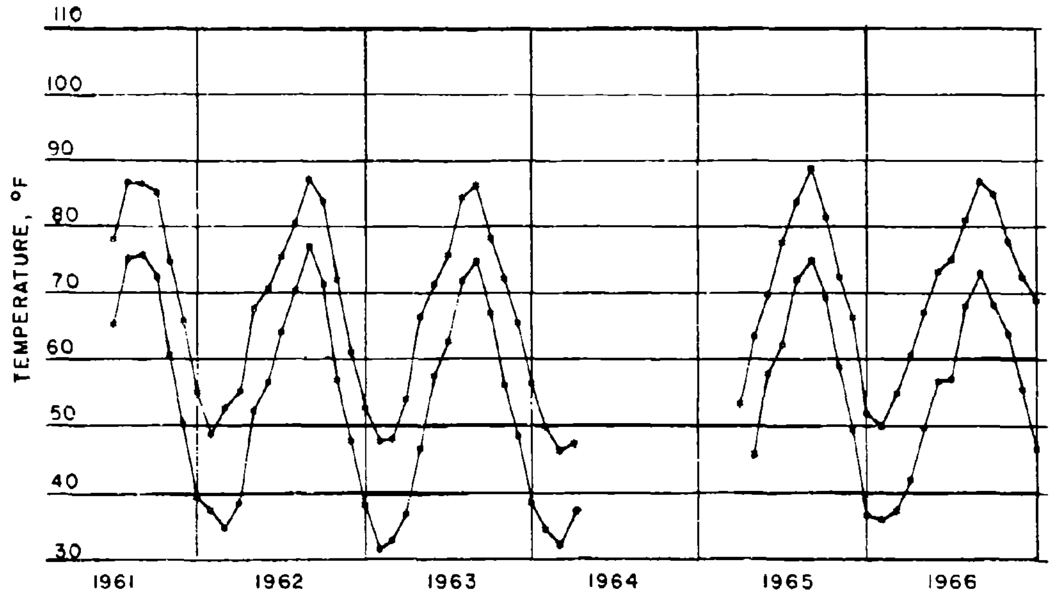

FIG. 9. The Average Maximum and Average Minimum Temperatures of Non-Earth-Covered Magazines at the Naval Air Station, Atsugi, Japan.

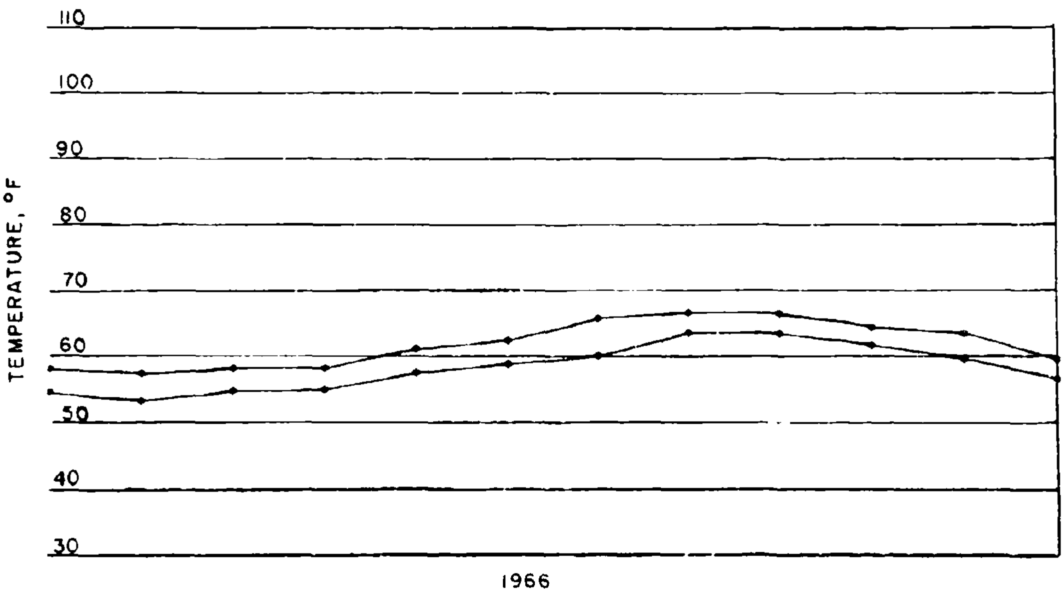

FIG. 10. The Average Maximum and Average Minimum Temperatures of Earth-Covered Magazines at the Naval Ordnance Facility, Yokosuka, Japan.

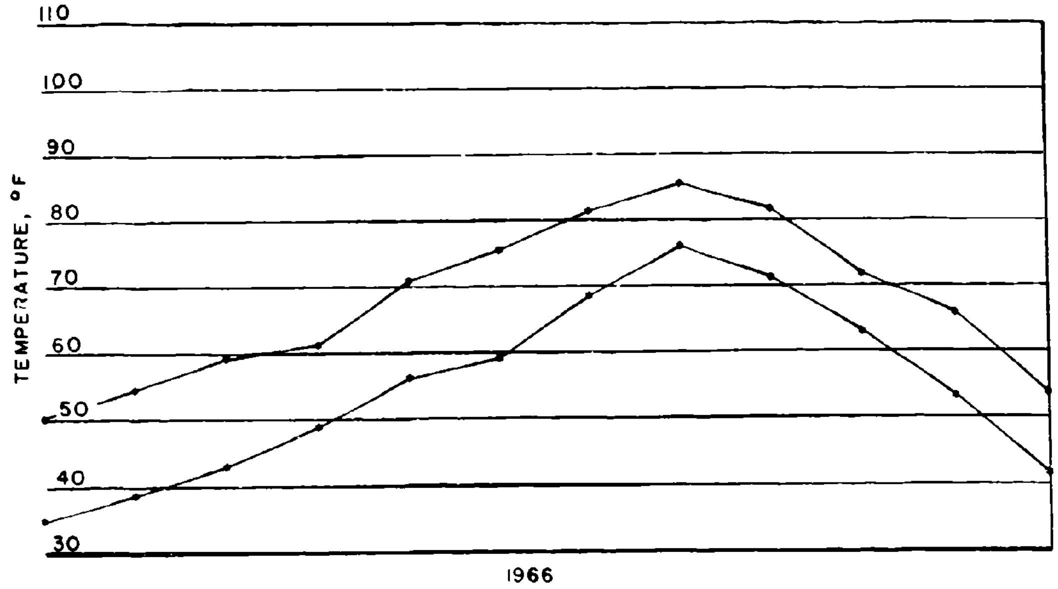

FIG. 11. The Average Maximum and Average Minimum Temperatures of Non-Earth-Covered Magazines at the Naval Ordnance Facility, Yokosuka, Japan.

The data from which the plots of Fig. 1-11 were taken are included in Appendix C. These data include the number of measured points from which the averages and the standard deviations were computed. The importance of reporting these data and the implications arising therefrom are discussed in Appendix D.

CONCLUSIONS

Assuming that the data are representative of the enclosed air temperatures encountered in the explosive hazard magazines located in Okinawa and Japan, the results indicate that ordnance, explosives, propellants, pyrotechnics, etc., stored in these storage magazines will probably never be subjected to temperatures exceeding 120°F for surface magazines and 115°F for earth-covered magazines (See Appendix D).

It has been found that the type of storage structure determines, to some extent, the storage temperatures (see Results and Appendix B). The temperature differences are, however, such that further detailed

study of structure effects on enclosed air temperatures is not warranted at the present time. Even the maximum air temperature (117°F) recorded in the non-earth-covered SH type shelter located at the Marine Corps Air Station, Iwakuni, Japan is nowhere near the existing storage specification temperature of 165°F.

Parts 1, 2, and 3 of this series of reports have, to a large extent, statistically established that the maximum storage specification air temperature of 165°F is not to be found in the explosive hazard magazines located in the desert, tropics, Okinawa, or Japan.

RECOMMENDATIONS

This report does not cover the minimum 11-year period of one solar cycle required to provide a thorough representation of the storage temperatures in Okinawa and Japan. Therefore, these reports, Parts 1, 2, and 3 of Storage Magazine Temperatures, should be used as a basis for the continuation of this program.

These reports on storage magazine enclosed air temperatures and oncoming similar reports should be used as a basis for the updating of the storage temperature requirements of the Military Specifications to which ordnance are designed.

It is also recommended that as significantly more data become available, this work be revised so that the trends become more obvious to the designer of new ordnance.

Appendix A

DATA HANDLING

The procedure for handling the storage temperature data is as follows:

Step 1. The applicable data are keypunched onto IBM type cards from the temperature summary sheets as received from the ammunition storage facility as shown in Table 2.

TABLE 2. Punchcard Data.

	Month	Day	Year	Type of Magazine	Temperature Reading, Low	Temperature Reading, High	Storage Location
Example	04	08	65	1YC7	45	48	Atsugi, Japan
Card Column	3 ------ 8			18-26	36-38	42-44	55-79

Step 2. The punched cards (step 1) are sorted in the following manner:

a. Storage location: NAF, Okinawa; NOF, Sasebo, Japan; MCAS, Iwakuni, Japan; NAS, Atsugi, Japan; NOF, Yokosuka, Japan.

b. Each group of cards by location into calendar sequence by:

(1) Month

(2) Day

(3) Year

Step 3. The "input deck" consists of: (1) UNIVAC 1108 computer program (450-52), (2) the sorted cards from step 2, and (3) a "total card" with the number of months of data included in columns 4 and 5. The computer program, 450-52, computes the averages and standard deviations of maximum and minimum temperatures of each month.

Step 4. The resulting output from step 3 consists of the output deck with averages and standard deviations of maximum and minimum temperatures punched in the cards as shown in Fig. 12. Microfilms containing data for each month; as sorted in step 2, are processed by the computer. Figure 13 is a photographic reproduction of a typical microfilm.

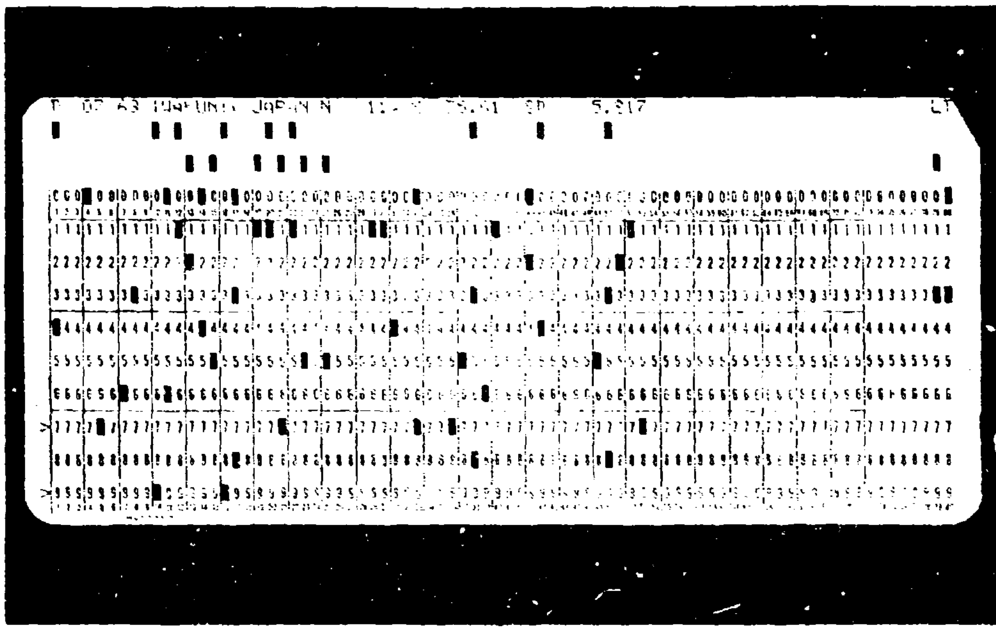

FIG. 12. Typical Data Card.

LOW TEMPERATURES
DATE = 07 63 LOCATION = IWAKUNI, JAPAN
N = 114 MEAN = 75.61 STANDARD DEVIATION = 5.217 NO.OVER 90 = 1 MAX = 0.
DATE = K.1

75.	65.	75.	67.	75.	74.	70.	70.	75.	75.	70.	77.	75.	75.	74.	74.	70.	76.	68.
73.	73.	76.	70.	75.	70.	75.	75.	75.	75.	72.	75.	75.	65.	75.	70.	74.	74.	69.
68.	75.	65.	75.	75.	75.	70.	75.	74.	75.	75.	70.	75.	74.	75.	81.	78.	78.	73.
75.	68.	73.	70.	75.	75.	77.	79.	76.	80.	80.	80.	80.	75.	75.	76.	75.	72.	75.
79.	78.	79.	80.	80.	80.	80.	80.	85.	80.	80.	75.	80.	75.	78.	75.	75.	82.	77.
85.	82.	80.	82.	80.	88.	84.	94.	72.	80.	85.	75.	80.	76.	80.	80.	85.	75.	70.

FIG. 13. Typical Microfilm Data.

Step 5. The output deck created in step 4 is reproduced on aperture cards. The microfilm of step 4 is cut in segments and mounted on an aperture card as shown in Fig. 14.

Step 6. The output deck is assembled with another UNIVAC 1108 computer program (450-53) and fed into the computer. The output from the computer is a curve such as that illustrated in Fig. 1 which plots the aver maximum and minimum temperatures for the effective ates of the output deck knowledge. The microfilm of this curve is also mounted on an aperture card.

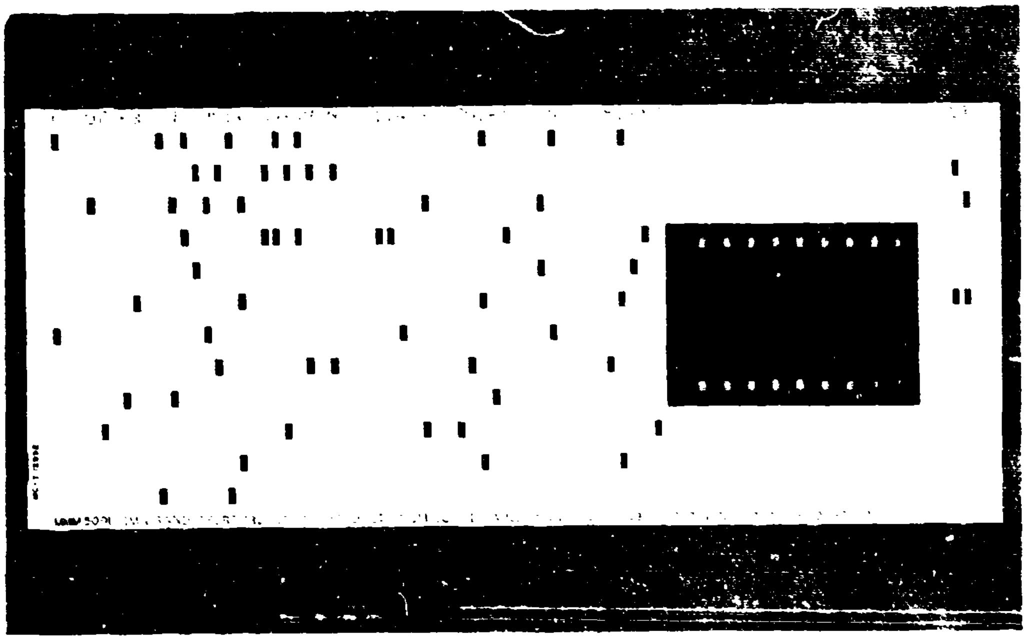

FIG. 14. Aperture Card with Microfilm Insert.

Appendix B

CLASSIFICATION OF MAGAZINES

Storage magazines differ in construction and deployment for the type of ammunition that is to be stowed. The storage magazines from which the temperature data have been collected differ greatly in that their classifications range from Explosive Hazard Magazines to storehouses. Their construction, labeling, maintenance, etc., and the frequency at which temperature measurements were taken are in accordance with the document "Ammunition Ashore Handling, Stowing, and Shipping," OP5, Vol. 1, second revision. The letter designations, intact as established by OP5, are presented in Table 3, so that the reader should have no difficulty in distinguishing between types of magazines that are found at the specified locations in the tropics.

In order to indicate the type of magazine, OP5 requires that the letter T is added if the magazine is earth-covered and barracaded; the letter C is added if the magazine is earth-covered but the door is not barracaded; and the letter S is added if the magazine is not earth-covered but is barracaded.

It is pointed out to the reader that in some cases the magazines at various facilities are not identified in accordance with OP5.

TABLE 3. Storage Magazine Description.

L to N Inclusive and Y Fire Hazard--Powder (Bulk, Semifixed or Bag Ammunition), Pyrotechnics, Ignition Fuzes and Primers, Small Arms, Smoke Drums, Chemical Ammunition.

Dimensions (nominal)	Normal Explosive Limit	Letter Designator
50' x 100' -----------	500,000 lbs -----------	L
25' x 80' triple arch	500,000 lbs -----------	L
52' dome (Corbetta type)	500,000 lbs -----------	D
50' x 60' -----------	300,000 lbs -----------	M
30' x 50' -----------	125,000 lbs -----------	N
25' x 48' -----------	125,000 lbs -----------	N
25' x 40' -----------	125,000 lbs -----------	N
Miscellaneous or non-standard size	Dependent upon location, size, and construction	Y

TABLE 3. (Contd).

P and Z Missile Hazard--Projectile and Fixed Ammunition

Dimensions (nominal)	Maximum Explosive Limit	Letter Designator
50' x 100' -----------	143,000 lbs -----------	P
25' x 80' triple arch	143,000 lbs (total for three arches)	P
52' dome (Corbetta type)	143,000 lbs -----------	D
Miscellaneous or non-standard size	143,000 lbs -----------	Z

A to K Inclusive and W, and X Explosion Hazard--High Explosive (Bulk, Depth Charges, Mines, Warheads, Bombs, etc.) Fuzes, Detonators, Exploders, Black Powder

Dimensions (nominal)	Normal Use	Normal Explosive Limit	Letter Designator
25' x 80' arch type (igloo)	High explosives	250,000 lbs	A
25' x 50' arch type (igloo)	High explosives	143,000 lbs	B
25' x 40' arch type (igloo)	High explosives	143,000 lbs	B
39' x 44' or 32' x 44' (war-head type)	High explosives	250,000 lbs	W
12' x 17' (box type)	Black powder	20,000 lbs	E
Miscellaneous or nonstandard size	High explosives	Dependent upon size, location, and construction	X
25' x 20' arch type (igloo)	Fuze and detonator	70,000 lbs	F
Dimensions vary (gallery or tunnel type)	High explosives	250,000 lbs	G

TABLE 3. (Contd).

Dimensions (nominal)	Normal Use	Normal Explosive Limit	Letter Designator
10' x 14'	Fuze and detonator	15,000 lbs	H
10' x 7'	Fuze and detonator	7,500 lbs	H
6' x 8'8" (keyport type)	High explosives	4,000 lbs	K

Miscellaneous Magazines

Dimensions (nominal)	Type	Letter Designator
25' x 68' -----------	Smoke drum type -----------	SD
25' x 34' -----------	Smoke drum type -----------	SD
25' x 51' -----------	Smoke drum type -----------	SD
	All inert storehouses	SH

Type of Hazard	Letter Designator
Explosive hazard magazine	X
Fire hazard magazine	Y
Missile hazard magazine	Z

NAVAL AIR FACILITY, NAHA, OKINAWA

There are 22 storage magazines from which the temperature data were taken. Seventeen magazines are earth-covered with letter designations LC, YC, XZC, and XTX (Fig. 15). Five magazines are non-earth-covered as shown in Fig. 16 and 17.

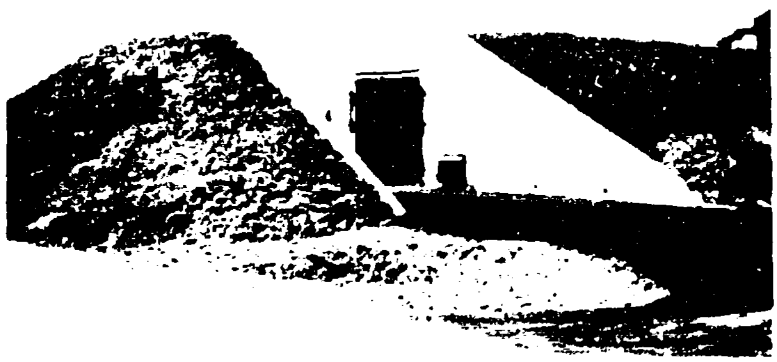

FIG. 15. NAF, Okinawa, Magazine 2XC3.

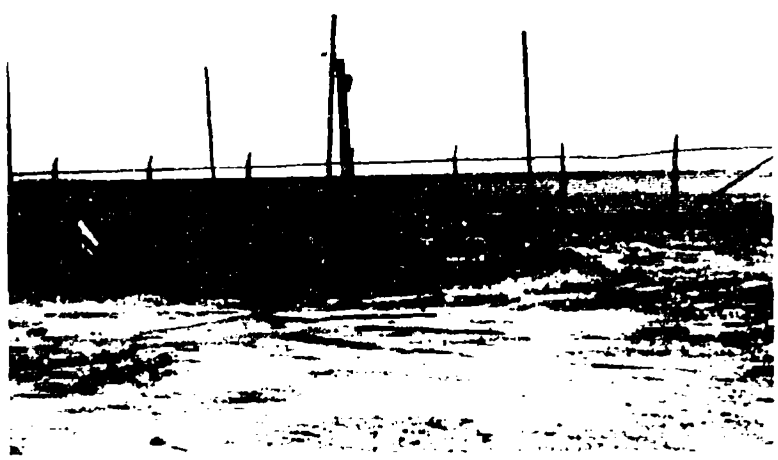

FIG. 16. NAF, Okinawa, Magazine 2XC10.

FIG. 17. NAF, Okinawa, Magazine 2Y9.

NAVAL ORDNANCE FACILITY, SASEBO, JAPAN

There are 52 magazines from which temperature data were taken. Sixteen magazines are earth-covered with letter designators ZTZ, ZCZ, XTX, XCX, and XC (Fig. 18). Thirty-six non-earth-covered magazines with letter designators ZSZ, YY, YSY, YS, ZZ, Y, XCX, XX, and SH (Fig. 19 and 20).

FIG. 18. NOF, Sasebo, Japan, Magazine 1ZCZ3, Tunnel.

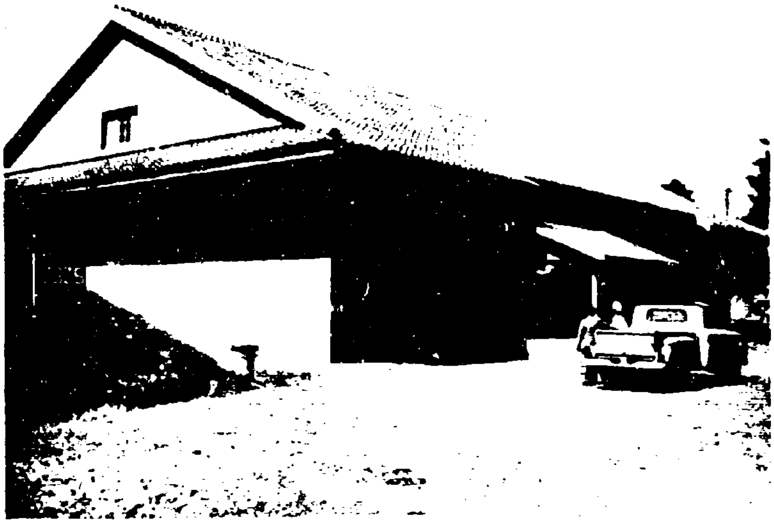

FIG. 19. NOF, Sasebo, Japan, Magazine 1ZSZ5.

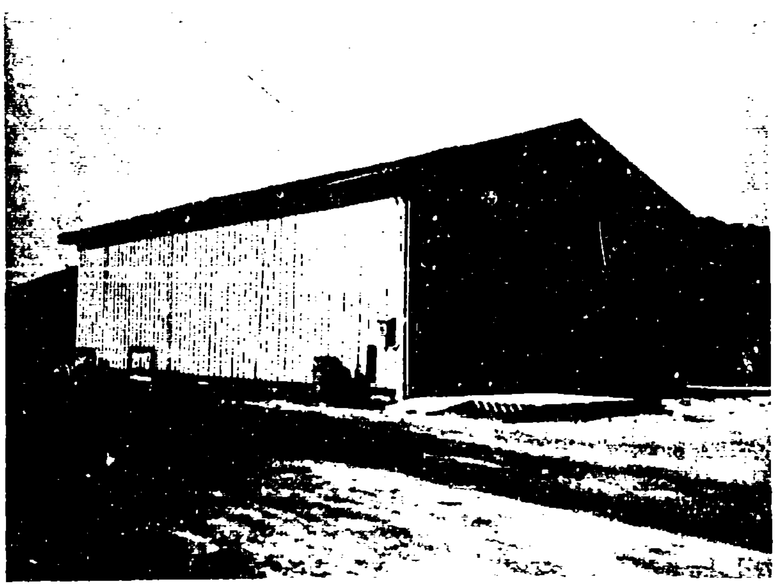

FIG. 20. NOF, Sasebo, Japan, Magazine 2YY17.

MARINE CORPS AIR STATION, IWAKUNI, JAPAN

There are 30 magazines from which temperature data were taken. Eighteen are earth-covered with letter designations XC, LCY, AT, and HT (Fig. 21). Twelve are non-earth-covered magazines with letter designators Y, SH, RX, Z, and X (Fig. 22). The highest recorded temperature (114°F) of an earth-covered magazine was from the magazine 4XC1B as shown in Fig. 23. A close look at the photograph will reveal that the thermometer is located at the base of the magazine very near the door; the reason for the high temperatures recorded from this magazine. The highest recorded temperature (117°F) of a non-earth-covered structure was from magazine 2SH2; a corrugated metal building with very little ventilation as shown in Fig. 22.

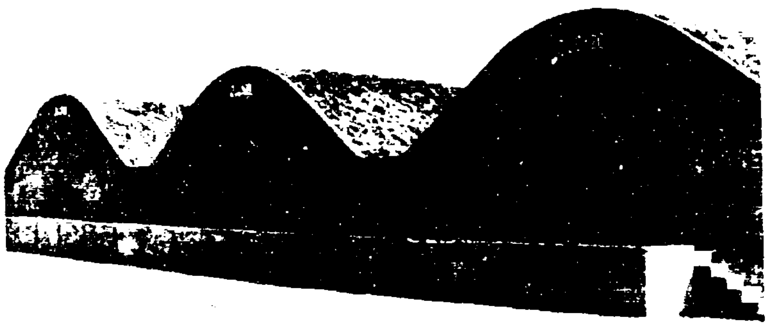

FIG. 21. MCAS, Iwakuni, Japan, Magazine 2LCY2.

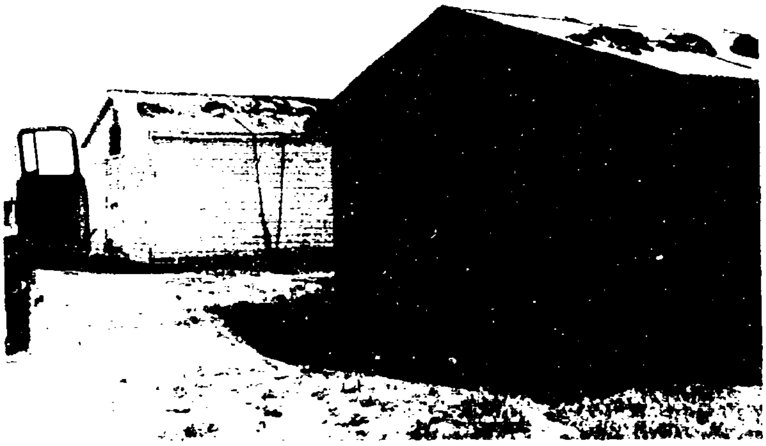

FIG. 22. MCAS, Iwakuni, Japan, Magazine 2SH2.

FIG. 23. MCAS, Iwakuni, Japan, Magazine 4XC1B.

NAVAL AIR STATION, ATSUGI, JAPAN

There are 42 magazines from which temperature data were taken. Twenty-one magazines are earth-covered with letter designations YC, XC, and 9SH2 (see Fig. 24 and 25). Twenty-one magazines are non-earth-covered with the letter designations SH, and X (Fig. 26).

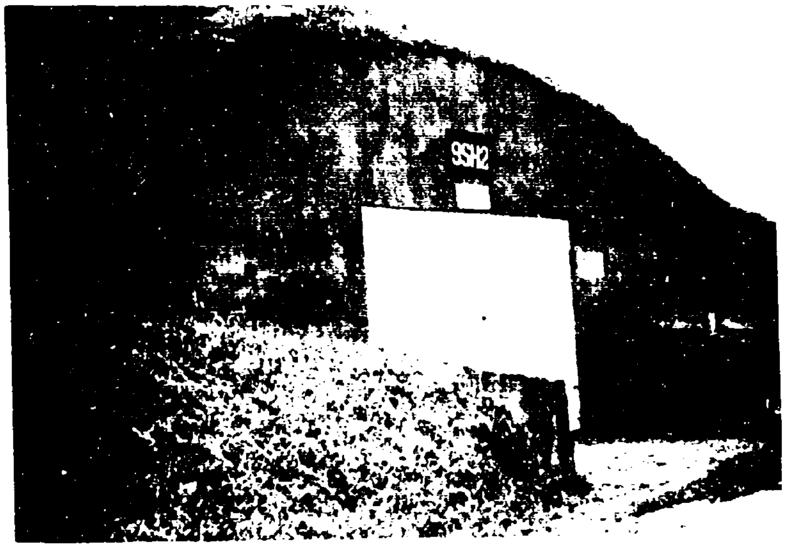

FIG. 24. NAS, Atsugi, Japan, Magazine 9SH2.

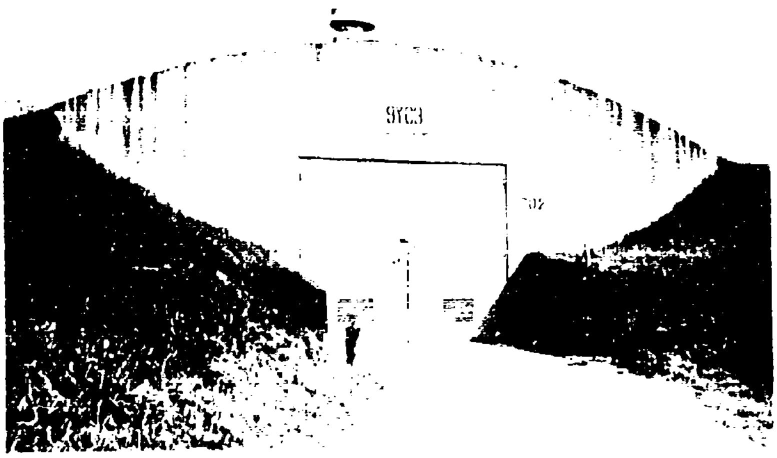

FIG. 25. NAS, Atsugi, Japan, Magazine 9YC3.

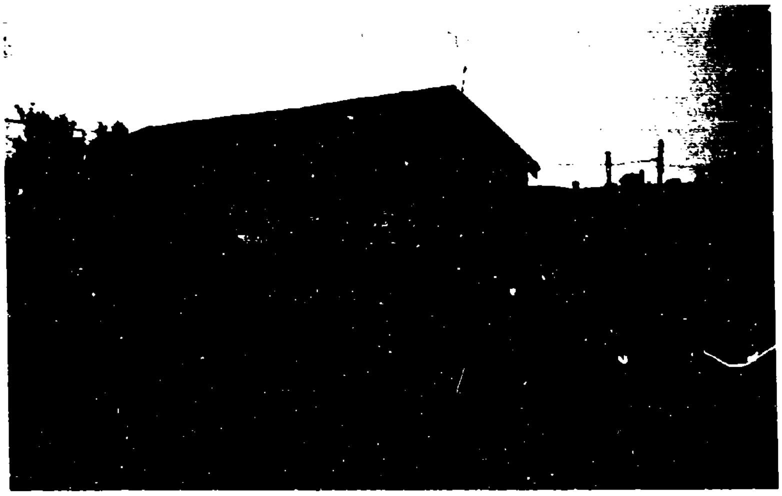

FIG. 26. NAS Atsugi, Japan, Magazine 6X2.

NAVAL ORDNANCE FACILITY, YOKOSUKA, JAPAN

There are 71 magazines from which temperature data were taken. Forty-seven magazines are earth-covered with letter designations YC, ZC, YCT, XCT, XC, XT, and ZCT (Fig. 27 and 28). Twenty-four magazines are non-earth-covered with letter designations Z, Y, XS, YS, X, ZS, and magazines 3XT15, 3XT17, and 3XT18. (Magazine 3XT15 is shown in Fig. 29.)

FIG. 27. NOF, Yokosuka, Japan, Magazine 3XCT13, Tunnel.

FIG. 28. NOF, Yokosuka, Japan, Inside of Magazine 5ZC8; Tunnel.

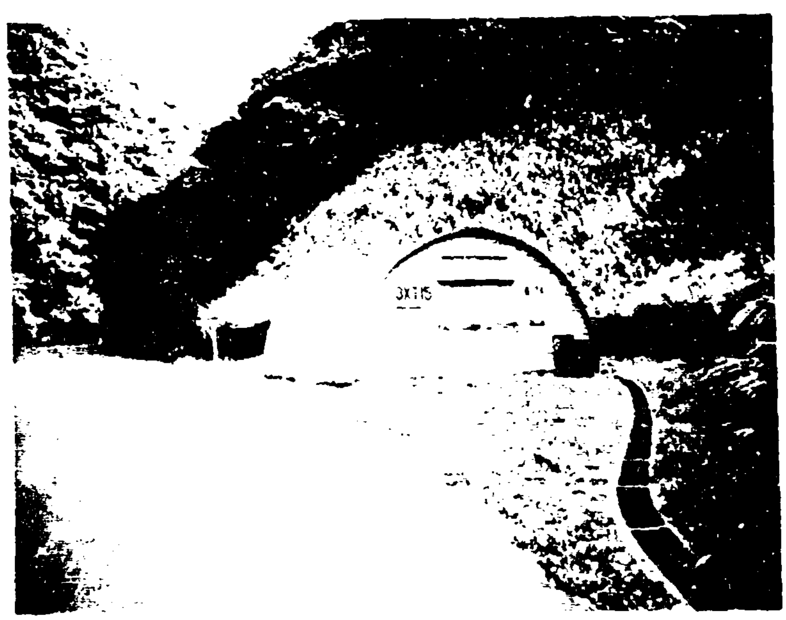

FIG. 29. NOF, Yokosuka, Japan, Magazine 3XT15.

Appendix C

APPLICABLE STATISTICS

The standard deviation given along with the average maximum and average minimum temperature is a measure of dispersion (precision, reproducibility, spread, scatter, etc.) of temperatures within the month. If it is assumed that the temperature readings within each month are dispersed normally (Gaussian distribution) then the standard deviation (σ) can easily be used for calculating the percentage of temperature readings that would exceed nominal temperatures. The Gaussian distribution is a group of measurements that has its measured frequencies bell-shaped about the average. That is, the spread of measurements below and above the averages would appear as equally descending bell-shaped curves on either side of the average.[1] Skewness is a term used to define the degree of departure from the symmetrical bell-shaped curve. Figure 30 presents this Gaussian information. The distributions for within-month temperatures differ from month to month in that the skewness of these distributions differ. However, the skewness is never so extreme that the assumption of normality, which can easily provide the prediction of approximate percentage points, can be discarded.

Temperature averages for the five storage sites in Japan and Okinawa under consideration in this report are given in Tables 4-14. An explanation of the symbols is as follows:

D = Date, followed by month and year

N = number of data points measured

X = average

SD = standard deviation

LT = low temperature (minimum)

HT = high temperature (maximum)

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[1] For a Gaussian distribution, the average (μ) minus 1 standard deviation (σ) to the average (μ) plus 1 standard deviation (σ), that is $\mu \pm 1\sigma$, includes approximately 68% of all the values of the distribution. Similarly $\mu \pm 2\sigma$ covers 95% and $\mu \pm 3\sigma$ covers 99% of all the values of the distribution.

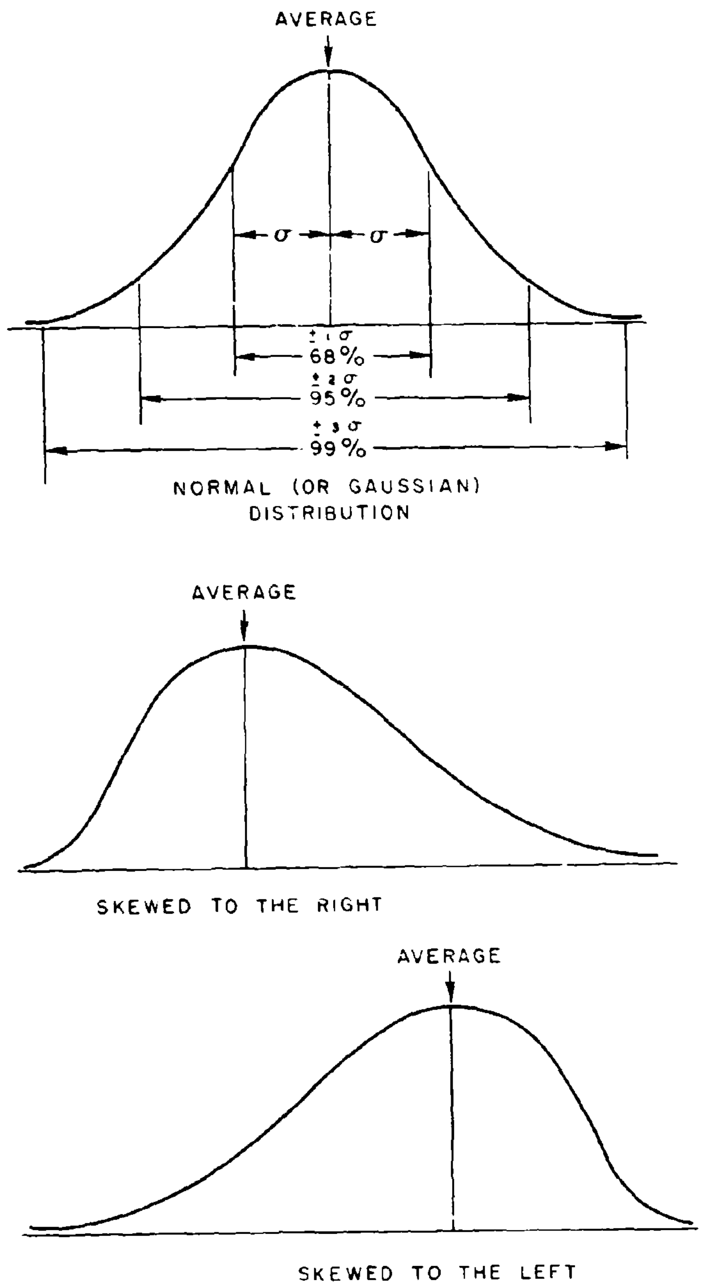

FIG. 30. Gaussian Distribution and Skewed Distributions.

TABLE 4. Minimum and Maximum Temperatures in Earth-Covered Storage Magazines, Monthly Summaries, NAF, Okinawa.

D	01	64	NAF,OKINAWA	N	12	X	55.25	SD	4.115	LT
D	01	64	NAF,OKINAWA	N	12	X	69.42	SD	2.811	HT
D	02	64	NAF,OKINAWA	N	12	X	52.25	SD	3.194	LT
D	02	64	NAF,OKINAWA	N	12	X	65.33	SD	3.939	HT
D	03	64	NAF,OKINAWA	N	12	X	56.42	SD	3.704	LT
D	03	64	NAF,OKINAWA	N	12	X	67.83	SD	2.406	HT
D	04	64	NAF,OKINAWA	N	12	X	62.33	SD	4.119	LT
D	04	64	NAF,OKINAWA	N	12	X	77.75	SD	1.603	HT
D	05	64	NAF,OKINAWA	N	12	X	73.33	SD	2.103	LT
D	05	64	NAF,OKINAWA	N	12	X	81.83	SD	4.152	HT
D	06	64	NAF,OKINAWA	N	12	X	73.00	SD	2.000	LT
D	06	64	NAF,OKINAWA	N	12	X	83.67	SD	3.114	HT
D	07	64	NAF,OKINAWA	N	12	X	76.58	SD	4.776	LT
D	07	64	NAF,OKINAWA	N	12	X	87.50	SD	4.011	HT
D	08	64	NAF,OKINAWA	N	11	X	80.09	SD	3.754	LT
D	08	64	NAF,OKINAWA	N	11	X	88.09	SD	2.914	HT
D	09	64	NAF,OKINAWA	N	11	X	79.18	SD	3.311	LT
D	09	64	NAF,OKINAWA	N	11	X	88.36	SD	3.171	HT
D	10	64	NAF,OKINAWA	N	11	X	77.18	SD	2.926	LT
D	10	64	NAF,OKINAWA	N	11	X	87.27	SD	2.724	HT
D	11	64	NAF,OKINAWA	N	11	X	71.27	SD	4.221	LT
D	11	64	NAF,OKINAWA	N	11	X	81.09	SD	3.270	HT
D	12	64	NAF,OKINAWA	N	11	X	63.27	SD	3.069	LT
D	12	64	NAF,OKINAWA	N	11	X	75.73	SD	3.289	HT
D	01	65	NAF,OKINAWA	N	11	X	56.91	SD	5.108	LT
D	01	65	NAF,OKINAWA	N	11	X	73.55	SD	3.387	HT
D	02	65	NAF,OKINAWA	N	17	X	58.59	SD	5.557	LT
D	02	65	NAF,OKINAWA	N	17	X	70.24	SD	4.[illegible]76	HT
D	03	65	NAF,OKINAWA	N	17	X	59.76	SD	2.[illegible]73	LT
D	03	65	NAF,OKINAWA	N	17	X	67.35	SD	3.121	HT
D	04	65	NAF,OKINAWA	N	17	X	61.29	SD	2.365	LT
D	04	65	NAF,OKINAWA	N	17	X	73.24	SD	3.615	HT
D	05	65	NAF,OKINAWA	N	17	X	67.76	SD	1.921	LT
D	05	65	NAF,OKINAWA	N	17	X	78.71	SD	4.858	HT
D	06	65	NAF,OKINAWA	N	17	X	72.53	SD	1.972	LT
D	06	65	NAF,OKINAWA	N	17	X	81.59	SD	3.163	HT
D	07	65	NAF,OKINAWA	N	17	X	78.94	SD	3.363	LT
D	07	65	NAF,OKINAWA	N	17	X	87.24	SD	2.840	HT
D	08	65	NAF,OKINAWA	N	17	X	80.41	SD	2.425	LT
D	08	65	NAF,OKINAWA	N	17	X	88.59	SD	3.104	HT
D	09	65	NAF,OKINAWA	N	17	X	78.18	SD	2.404	LT
D	09	65	NAF,OKINAWA	N	17	X	87.53	SD	3.659	HT
D	10	65	NAF,OKINAWA	N	17	X	71.12	SD	4.470	LT

TABLE 4. Minimum and Maximum Temperatures in Earth-Covered Storage Magazines, Monthly Summaries, NAF, Okinawa (Contd).

D	10	65	NAF,OKINAWA	N	17	X	86.00	SD	7.425	HT
D	11	65	NAF,OKINAWA	N	17	X	71.88	SD	2.595	LT
D	11	65	NAF,OKINAWA	N	17	X	78.65	SD	3.552	HT
D	12	65	NAF,OKINAWA	N	17	X	63.88	SD	4.196	LT
D	12	65	NAF,OKINAWA	N	17	X	74.71	SD	3.584	HT
D	01	66	NAF,OKINAWA	N	16	X	62.56	SD	4.289	LT
D	01	66	NAF,OKINAWA	N	16	X	73.69	SD	4.672	HT
D	02	66	NAF,OKINAWA	N	16	X	61.69	SD	7.543	LT
D	02	66	NAF,OKINAWA	N	16	X	74.12	SD	5.071	HT
D	03	66	NAF,OKINAWA	N	17	X	63.18	SD	5.235	LT
D	03	66	NAF,OKINAWA	N	17	X	73.76	SD	3.849	HT
D	04	66	NAF,OKINAWA	N	10	X	65.60	SD	3.098	LT
D	04	66	NAF,OKINAWA	N	10	X	71.80	SD	3.048	HT
D	05	66	NAF,OKINAWA	N	7	X	63.57	SD	1.813	LT
D	05	66	NAF,OKINAWA	N	7	X	75.43	SD	3.735	HT
D	06	66	NAF,OKINAWA	N	15	X	70.93	SD	2.251	LT
D	06	66	NAF,OKINAWA	N	15	X	81.20	SD	2.396	HT
D	07	66	NAF,OKINAWA	N	15	X	75.13	SD	3.962	LT
D	07	66	NAF,OKINAWA	N	15	X	86.33	SD	3.155	HT
D	08	66	NAF,OKINAWA	N	15	X	79.40	SD	4.067	LT
D	08	66	NAF,OKINAWA	N	15	X	87.27	SD	2.344	HT
D	09	66	NAF,OKINAWA	N	16	X	75.25	SD	3.606	LT
D	09	66	NAF,OKINAWA	N	16	X	86.06	SD	3.356	HT
D	10	66	NAF,OKINAWA	N	17	X	73.76	SD	3.231	LT
D	10	66	NAF,OKINAWA	N	17	X	83.76	SD	5.652	HT
D	11	66	NAF,OKINAWA	N	17	X	68.94	SD	4.097	LT
D	11	66	NAF,OKINAWA	N	17	X	73.88	SD	2.977	HT
D	12	66	NAF,OKINAWA	N	10	X	64.20	SD	5.371	LT
D	12	66	NAF,OKINAWA	N	10	X	76.30	SD	3.860	HT

TABLE 5. Minimum and Maximum Temperatures in Non-Earth-Covered Storage Magazines, Monthly Summaries, NAF, Okinawa.

D	01	64	NAF,OKINAWA	N	2	X	53.00	SD	2.828	LT
D	01	64	NAF,OKINAWA	N	2	X	69.50	SD	4.950	HT
D	02	64	NAF,OKINAWA	N	2	X	51.50	SD	.707	LT
D	02	64	NAF,OKINAWA	N	2	X	67.50	SD	.707	HT
D	03	64	NAF,OKINAWA	N	2	X	58.50	SD	3.536	LT
D	03	64	NAF,OKINAWA	N	2	X	75.00	SD	-.000	HT
D	04	64	NAF,OKINAWA	N	2	X	62.00	SD	2.828	LT
D	04	64	NAF,OKINAWA	N	2	X	85.00	SD	-.000	HT
D	05	64	NAF,OKINAWA	N	2	X	70.00	SD	-.000	LT
D	05	64	NAF,OKINAWA	N	2	X	88.50	SD	2.121	HT
D	06	64	NAF,OKINAWA	N	2	X	70.00	SD	1.414	
D	06	64	NAF,OKINAWA	N	2	X	90.00	SD	4.243	
D	07	64	NAF,OKINAWA	N	2	X	81.00	SD	1.414	
D	07	64	NAF,OKINAWA	N	2	X	95.50	SD	.707	HT
D	08	64	NAF,OKINAWA	N	2	X	82.50	SD	.707	LT
D	08	64	NAF,OKINAWA	N	2	X	95.00	SD	-.000	HT
D	09	64	NAF,OKINAWA	N	2	X	85.00	SD	1.414	LT
D	09	64	NAF,OKINAWA	N	2	X	93.00	SD	-.000	HT
D	10	64	NAF,OKINAWA	N	2	X	77.00	SD	2.828	LT
D	10	64	NAF,OKINAWA	N	2	X	92.50	SD	.707	HT
D	11	64	NAF,OKINAWA	N	2	X	68.50	SD	2.121	LT
D	11	64	NAF,OKINAWA	N	2	X	86.00	SD	1.414	HT
D	12	64	NAF,OKINAWA	N	2	X	64.00	SD	5.657	LT
D	12	64	NAF,OKINAWA	N	2	X	87.50	SD	14.849	HT
D	01	65	NAF,OKINAWA	N	2	X	56.50	SD	3.536	LT
D	01	65	NAF,OKINAWA	N	2	X	77.00	SD	2.828	HT
D	02	65	NAF,OKINAWA	N	3	X	59.33	SD	1.155	LT
D	02	65	NAF,OKINAWA	N	3	X	78.00	SD	5.196	HT
D	03	65	NAF,OKINAWA	N	3	X	59.67	SD	5.508	LT
D	03	65	NAF,OKINAWA	N	3	X	74.67	SD	1.155	HT
D	04	65	NAF,OKINAWA	N	3	X	64.00	SD	4.000	LT
D	04	65	NAF,OKINAWA	N	3	X	85.00	SD	2.000	HT
D	05	65	NAF,OKINAWA	N	24	X	70.29	SD	1.398	LT
D	05	65	NAF,OKINAWA	N	24	X	82.71	SD	2.074	HT
D	06	65	NAF,OKINAWA	N	25	X	74.84	SD	2.528	LT
D	06	65	NAF,OKINAWA	N	25	X	89.00	SD	3.055	HT
D	07	65	NAF,OKINAWA	N	25	X	82.44	SD	1.583	LT
D	07	65	NAF,OKINAWA	N	25	X	94.00	SD	1.658	HT
D	08	65	NAF,OKINAWA	N	25	X	81.00	SD	2.021	LT
D	08	65	NAF,OKINAWA	N	25	X	94.24	SD	1.921	HT
D	09	65	NAF,OKINAWA	N	25	X	79.44	SD	1.557	LT
D	09	65	NAF,OKINAWA	N	25	X	92.40	SD	1.472	HT
D	10	65	NAF,OKINAWA	N	24	X	72.04	SD	4.582	LT

TABLE 5. Minimum and Maximum Temperatures in Non-Earth-Covered Storage Magazines, Monthly Summaries, NAF, Okinawa (Contd).

D	10	65	NAF,OKINAWA	N	24	X	87.00	SD	5.509	HT
D	11	65	NAF,OKINAWA	N	25	X	69.24	SD	2.146	LT
D	11	65	NAF,OKINAWA	N	25	X	81.20	SD	2.483	HT
D	12	65	NAF,OKINAWA	N	26	X	59.31	SD	3.496	LT
D	12	65	NAF,OKINAWA	N	26	X	75.27	SD	3.219	HT
D	01	66	NAF,OKINAWA	N	24	X	58.92	SD	3.412	LT
D	01	66	NAF,OKINAWA	N	24	X	72.50	SD	4.453	HT
D	02	66	NAF,OKINAWA	N	23	X	58.52	SD	2.150	LT
D	02	66	NAF,OKINAWA	N	23	X	72.22	SD	4.833	HT
D	03	66	NAF,OKINAWA	N	26	X	63.04	SD	2.946	LT
D	03	66	NAF,OKINAWA	N	26	X	76.04	SD	3.627	HT
D	04	66	NAF,OKINAWA	N	24	X	67.75	SD	3.926	LT
D	04	66	NAF,OKINAWA	N	24	X	78.83	SD	4.527	HT
D	05	66	NAF,OKINAWA	N	31	X	70.97	SD	4.750	LT
D	05	66	NAF,OKINAWA	N	31	X	82.06	SD	2.695	HT
D	06	66	NAF,OKINAWA	N	33	X	75.39	SD	4.663	LT
D	06	66	NAF,OKINAWA	N	33	X	85.48	SD	5.221	HT
D	07	66	NAF,OKINAWA	N	34	X	90.88	SD	2.371	HT
D	07	66	NAF,OKINAWA	N	34	X	81.38	SD	4.250	LT
D	08	66	NAF,OKINAWA	N	34	X	83.71	SD	2.813	LT
D	08	66	NAF,OKINAWA	N	34	X	92.97	SD	3.680	HT
D	09	66	NAF,OKINAWA	N	33	X	79.82	SD	2.256	LT
D	09	66	NAF,OKINAWA	N	33	X	89.61	SD	3.791	HT
D	10	66	NAF,OKINAWA	N	34	X	74.41	SD	1.811	LT
D	10	66	NAF,OKINAWA	N	34	X	82.85	SD	3.066	HT
D	11	66	NAF,OKINAWA	N	33	X	68.55	SD	3.317	LT
D	11	66	NAF,OKINAWA	N	33	X	77.85	SD	3.203	HT
D	12	66	NAF,OKINAWA	N	2	X	59.50	SD	4.950	LT
D	12	66	NAF,OKINAWA	N	2	X	81.50	SD	4.950	HT

TABLE 6. Minimum and Maximum Temperatures in Earth-Covered and Non-Earth-Covered Storage, Monthly Summaries, NOF, Sasebo, Japan.

D	04	62	SASEBO,	JAPAN	N	1	X	58.00	SD	.000	LT
D	04	62	SASEBO,	JAPAN	N	1	X	62.00	SD	.000	HT
D	05	62	SASEBO,	JAPAN	N	4	X	57.75	SD	4.425	LT
D	05	62	SASEBO,	JAPAN	N	4	X	66.25	SD	1.708	HT
D	06	62	SASEBO,	JAPAN	N	4	X	64.00	SD	4.830	LT
D	06	62	SASEBO,	JAPAN	N	4	X	70.50	SD	1.732	HT
D	07	62	SASEBO,	JAPAN	N	5	X	69.20	SD	4.324	LT
D	07	62	SASEBO,	JAPAN	N	5	X	75.80	SD	4.604	HT
D	08	62	SASEBO,	JAPAN	N	4	X	73.75	SD	1.893	LT
D	08	62	SASEBO,	JAPAN	N	4	X	79.00	SD	1.633	HT
D	09	62	SASEBO,	JAPAN	N	4	X	71.75	SD	.957	LT
D	09	62	SASEBO,	JAPAN	N	4	X	78.00	SD	.816	HT
D	10	62	SASEBO,	JAPAN	N	5	X	64.40	SD	2.608	LT
D	10	62	SASEBO,	JAPAN	N	5	X	70.80	SD	2.775	HT
D	11	62	SASEBO,	JAPAN	N	4	X	60.50	SD	3.697	LT
D	11	62	SASEBO,	JAPAN	N	4	X	67.75	SD	1.708	HT
D	12	62	SASEBO,	JAPAN	N	5	X	54.00	SD	1.225	LT
D	12	62	SASEBO,	JAPAN	N	5	X	59.60	SD	3.209	HT
D	01	63	SASEBO,	JAPAN	N	5	X	52.20	SD	3.194	LT
D	01	63	SASEBO,	JAPAN	N	5	X	58.20	SD	2.168	HT
D	02	63	SASEBO,	JAPAN	N	4	X	48.00	SD	2.449	LT
D	02	63	SASEBO,	JAPAN	N	4	X	56.25	SD	2.062	HT
D	03	63	SASEBO,	JAPAN	N	4	X	49.75	SD	3.594	LT
D	03	63	SASEBO,	JAPAN	N	4	X	57.50	SD	2.517	HT
D	04	63	SASEBO,	JAPAN	N	5	X	52.20	SD	2.588	LT
D	04	63	SASEBO,	JAPAN	N	5	X	61.80	SD	2.864	HT
D	05	63	SASEBO,	JAPAN	N	4	X	59.00	SD	3.559	LT
D	05	63	SASEBO,	JAPAN	N	4	X	67.75	SD	3.500	HT
D	06	63	SASEBO,	JAPAN	N	4	X	66.50	SD	2.517	LT
D	06	63	SASEBO,	JAPAN	N	4	X	73.00	SD	2.449	HT
D	07	63	SASEBO,	JAPAN	N	5	X	72.00	SD	4.301	LT
D	07	63	SASEBO,	JAPAN	N	5	X	77.80	SD	3.493	HT
D	08	63	SASEBO,	JAPAN	N	4	X	76.75	SD	.500	LT
D	08	63	SASEBO,	JAPAN	N	4	X	81.00	SD	1.826	HT
D	09	63	SASEBO,	JAPAN	N	5	X	71.80	SD	3.493	LT
D	09	63	SASEBO,	JAPAN	N	5	X	76.40	SD	2.702	HT
D	10	63	SASEBO,	JAPAN	N	3	X	63.00	SD	1.732	LT
D	10	63	SASEBO,	JAPAN	N	3	X	69.67	SD	1.528	HT
D	11	63	SASEBO,	JAPAN	N	4	X	59.25	SD	2.217	LT
D	11	63	SASEBO,	JAPAN	N	4	X	65.50	SD	1.000	HT
D	12	63	SASEBO,	JAPAN	N	4	X	54.00	SD	1.155	LT
D	12	63	SASEBO,	JAPAN	N	4	X	58.75	SD	1.708	HT

TABLE 6. Minimum and Maximum Temperatures in Earth-Covered and Non-Earth-Covered Storage, Monthly Summaries, NOF, Sasebo, Japan (Contd).

D	01	64	SASEBO,	JAPAN	N	3	X	50.33	SD	3.055	LT
D	01	64	SASEBO,	JAPAN	N	3	X	59.00	SD	1.000	HT
D	02	64	SASEBO,	JAPAN	N	5	X	47.20	SD	1.643	LT
D	02	64	SASEBO,	JAPAN	N	5	X	55.40	SD	2.608	HT
D	03	64	SASEBO,	JAPAN	N	5	X	50.60	SD	1.817	LT
D	03	64	SASEBO,	JAPAN	N	5	X	56.80	SD	1.304	HT
D	04	64	SASEBO,	JAPAN	N	3	X	58.67	SD	6.028	LT
D	04	64	SASEBO,	JAPAN	N	3	X	66.67	SD	5.508	HT
D	05	64	SASEBO,	JAPAN	N	5	X	63.00	SD	1.225	LT
D	05	64	SASEBO,	JAPAN	N	5	X	69.00	SD	1.673	HT
D	06	64	SASEBO,	JAPAN	N	5	X	67.00	SD	2.739	LT
D	06	64	SASEBO,	JAPAN	N	5	X	72.80	SD	2.775	HT
D	07	64	SASEBO,	JAPAN	N	4	X	71.25	SD	4.272	LT
D	07	64	SASEBO,	JAPAN	N	4	X	77.25	SD	3.096	HT
D	08	64	SASEBO,	JAPAN	N	5	X	76.60	SD	3.782	LT
D	08	64	SASEBO,	JAPAN	N	5	X	81.60	SD	1.817	HT
D	09	64	SASEBO,	JAPAN	N	4	X	73.50	SD	2.380	LT
D	09	64	SASEBO,	JAPAN	N	4	X	79.75	SD	.957	HT
D	10	64	SASEBO,	JAPAN	N	4	X	67.25	SD	.957	LT
D	10	64	SASEBO,	JAPAN	N	4	X	73.75	SD	1.258	HT
D	11	64	SASEBO,	JAPAN	N	4	X	61.75	SD	2.986	LT
D	11	64	SASEBO,	JAPAN	N	4	X	67.00	SD	2.582	HT
D	12	64	SASEBO,	JAPAN	N	4	X	52.00	SD	3.367	LT
D	12	64	SASEBO,	JAPAN	N	4	X	60.00	SD	2.160	HT
D	01	65	SASEBO,	JAPAN	N	4	X	48.25	SD	3.304	LT
D	01	65	SASEBO,	JAPAN	N	4	X	55.50	SD	4.203	HT
D	02	65	SASEBO,	JAPAN	N	3	X	46.67	SD	2.082	LT
D	02	65	SASEBO,	JAPAN	N	3	X	53.33	SD	3.512	HT
D	03	65	SASEBO,	JAPAN	N	3	X	47.67	SD	.577	LT
D	03	65	SASEBO,	JAPAN	N	3	X	55.67	SD	.577	HT
D	04	65	SASEBO,	JAPAN	N	3	X	50.33	SD	1.528	LT
D	04	65	SASEBO,	JAPAN	N	3	X	59.33	SD	1.528	HT
D	05	65	SASEBO,	JAPAN	N	3	X	58.00	SD	2.000	LT
D	05	65	SASEBO,	JAPAN	N	3	X	64.67	SD	1.528	HT
D	06	65	SASEBO,	JAPAN	N	3	X	63.33	SD	4.163	LT
D	06	65	SASEBO,	JAPAN	N	3	X	70.67	SD	2.309	HT
D	07	65	SASEBO,	JAPAN	N	3	X	68.33	SD	3.786	LT
D	07	65	SASEBO,	JAPAN	N	3	X	75.33	SD	3.786	HT
D	08	65	SASEBO,	JAPAN	N	4	X	73.00	SD	.816	LT
D	08	65	SASEBO,	JAPAN	N	4	X	78.00	SD	2.160	HT
D	09	65	SASEBO,	JAPAN	N	3	X	68.67	SD	2.309	LT
D	09	65	SASEBO,	JAPAN	N	3	X	73.67	SD	2.309	HT
D	10	65	SASEBO,	JAPAN	N	2	X	64.50	SD	.707	LT
D	10	65	SASEBO,	JAPAN	N	2	X	69.00	SD	2.828	HT
D	11	65	SASEBO,	JAPAN	N	5	X	61.60	SD	2.915	LT
D	11	65	SASEBO,	JAPAN	N	5	X	65.80	SD	3.493	HT
D	12	65	SASEBO,	JAPAN	N	2	X	52.50	SD	2.121	LT
D	12	65	SASEBO,	JAPAN	N	2	X	57.50	SD	2.121	HT

TABLE 7. Minimum and Maximum Temperatures in Earth-Covered Storage, Monthly Summaries, NOF, Sasebo, Japan.

D	01	66	SASEBO,	JAPAN	N	12	X	58.42	SD	3.118	LT
D	01	66	SASEBO,	JAPAN	N	12	X	60.00	SD	3.045	HT
D	02	66	SASEBO,	JAPAN	N	12	X	57.75	SD	3.415	LT
D	02	66	SASEBO,	JAPAN	N	12	X	59.25	SD	2.340	HT
D	03	66	SASEBO,	JAPAN	N	14	X	56.29	SD	7.937	LT
D	03	66	SASEBO,	JAPAN	N	14	X	59.50	SD	3.132	HT
D	04	66	SASEBO,	JAPAN	N	14	X	57.57	SD	2.533	LT
D	04	66	SASEBO,	JAPAN	N	14	X	59.71	SD	2.335	HT
D	05	66	SASEBO,	JAPAN	N	15	X	58.00	SD	2.236	LT
D	05	66	SASEBO,	JAPAN	N	15	X	59.60	SD	1.765	HT
D	06	66	SASEBO,	JAPAN	N	13	X	59.23	SD	2.166	LT
D	06	66	SASEBO,	JAPAN	N	13	X	61.38	SD	2.293	HT
D	07	66	SASEBO,	JAPAN	N	11	X	60.64	SD	1.286	LT
D	07	66	SASEBO,	JAPAN	N	11	X	63.73	SD	2.970	HT
D	08	66	SASEBO,	JAPAN	N	11	X	63.64	SD	2.873	LT
D	08	66	SASEBO,	JAPAN	N	11	X	64.73	SD	4.052	HT
D	09	66	SASEBO,	JAPAN	N	14	X	66.14	SD	4.016	LT
D	09	66	SASEBO,	JAPAN	N	14	X	69.21	SD	5.549	HT
D	10	66	SASEBO,	JAPAN	N	13	X	65.62	SD	2.364	LT
D	10	66	SASEBO,	JAPAN	N	13	X	67.62	SD	4.788	HT
D	11	66	SASEBO,	JAPAN	N	13	X	62.46	SD	2.665	LT
D	11	66	SASEBO,	JAPAN	N	13	X	64.77	SD	1.301	HT
D	12	66	SASEBO,	JAPAN	N	14	X	61.50	SD	3.757	LT
D	12	66	SASEBO,	JAPAN	N	14	X	63.71	SD	2.701	HT

TABLE 8. Minimum and Maximum Temperatures in Non-Earth-Covered Storage, Monthly Summaries, NOF, Sasebo, Japan.

D	01	66	SASEBO, JAPAN	N	27	X	38.33	SD	5.910	LT
D	01	66	SASEBO, JAPAN	N	27	X	47.33	SD	2.828	HT
D	02	66	SASEBO, JAPAN	N	27	X	40.41	SD	5.250	LT
D	02	66	SASEBO, JAPAN	N	27	X	53.22	SD	4.209	HT
D	03	66	SASEBO, JAPAN	N	30	X	43.97	SD	5.684	LT
D	03	66	SASEBO, JAPAN	N	30	X	55.50	SD	5.888	HT
D	04	66	SASEBO, JAPAN	N	28	X	46.89	SD	5.698	LT
D	04	66	SASEBO, JAPAN	N	28	X	58.39	SD	4.732	HT
D	05	66	SASEBO, JAPAN	N	33	X	51.76	SD	5.397	LT
D	05	66	SASEBO, JAPAN	N	33	X	65.70	SD	8.045	HT
D	06	66	SASEBO, JAPAN	N	30	X	54.43	SD	6.971	LT
D	06	66	SASEBO, JAPAN	N	30	X	72.13	SD	5.097	HT
D	07	66	SASEBO, JAPAN	N	28	X	68.14	SD	4.672	LT
D	07	66	SASEBO, JAPAN	N	28	X	77.68	SD	6.832	HT
D	08	66	SASEBO, JAPAN	N	29	X	77.55	SD	6.248	LT
D	08	66	SASEBO, JAPAN	N	29	X	86.76	SD	5.090	HT
D	09	66	SASEBO, JAPAN	N	30	X	80.17	SD	2.890	LT
D	09	66	SASEBO, JAPAN	N	30	X	86.07	SD	5.219	HT
D	10	66	SASEBO, JAPAN	N	30	X	66.40	SD	5.624	LT
D	10	66	SASEBO, JAPAN	N	30	X	73.83	SD	5.402	HT
D	11	66	SASEBO, JAPAN	N	29	X	61.10	SD	4.858	LT
D	11	66	SASEBO, JAPAN	N	29	X	67.31	SD	4.892	HT
D	12	66	SASEBO, JAPAN	N	31	X	47.74	SD	7.216	LT
D	12	66	SASEBO, JAPAN	N	31	X	57.26	SD	5.938	HT

TABLE 9. Minimum and Maximum Temperatures in Earth-Covered Storage, Monthly Summaries, MCAS, Iwakuni, Japan.

D	07	63	IWAKUNI, JAPAN	N	114	X	75.61	SD	5.217	LT
D	07	63	IWAKUNI, JAPAN	N	114	X	81.68	SD	6.311	HT
D	08	63	IWAKUNI, JAPAN	N	100	X	79.14	SD	3.039	LT
D	08	63	IWAKUNI, JAPAN	N	100	X	84.50	SD	4.198	HT
D	09	63	IWAKUNI, JAPAN	N	69	X	74.28	SD	4.273	LT
D	09	63	IWAKUNI, JAPAN	N	69	X	80.49	SD	4.868	HT
D	10	63	IWAKUNI, JAPAN	N	74	X	66.18	SD	4.408	LT
D	10	63	IWAKUNI, JAPAN	N	74	X	71.24	SD	5.152	HT
D	11	63	IWAKUNI, JAPAN	N	67	X	59.01	SD	4.312	LT
D	11	63	IWAKUNI, JAPAN	N	67	X	64.88	SD	4.021	HT
D	12	63	IWAKUNI, JAPAN	N	69	X	50.54	SD	4.009	LT
D	12	63	IWAKUNI, JAPAN	N	69	X	55.45	SD	3.475	HT
D	01	64	IWAKUNI, JAPAN	N	83	X	47.70	SD	3.718	LT
D	01	64	IWAKUNI, JAPAN	N	83	X	52.25	SD	3.227	HT
D	02	64	IWAKUNI, JAPAN	N	78	X	43.69	SD	3.676	LT
D	02	64	IWAKUNI, JAPAN	N	78	X	48.65	SD	3.921	HT
D	03	64	IWAKUNI, JAPAN	N	88	X	46.75	SD	2.797	LT
D	03	64	IWAKUNI, JAPAN	N	88	X	51.60	SD	4.050	HT
D	04	64	IWAKUNI, JAPAN	N	73	X	54.78	SD	5.202	LT
D	04	64	IWAKUNI, JAPAN	N	73	X	63.71	SD	7.015	HT
D	05	64	IWAKUNI, JAPAN	N	65	X	61.94	SD	3.561	LT
D	05	64	IWAKUNI, JAPAN	N	65	X	68.85	SD	5.133	HT
D	06	64	IWAKUNI, JAPAN	N	70	X	68.07	SD	2.149	LT
D	06	64	IWAKUNI, JAPAN	N	70	X	73.14	SD	4.691	HT
D	07	64	IWAKUNI, JAPAN	N	47	X	74.21	SD	5.872	LT
D	07	64	IWAKUNI, JAPAN	N	47	X	83.64	SD	7.158	HT
D	08	64	IWAKUNI, JAPAN	N	83	X	82.34	SD	2.032	LT
D	08	64	IWAKUNI, JAPAN	N	83	X	86.51	SD	5.090	HT
D	09	64	IWAKUNI, JAPAN	N	87	X	79.00	SD	3.692	LT
D	09	64	IWAKUNI, JAPAN	N	87	X	83.89	SD	4.504	HT
D	10	64	IWAKUNI, JAPAN	N	73	X	69.84	SD	3.969	LT
D	10	64	IWAKUNI, JAPAN	N	73	X	75.36	SD	5.460	HT
D	11	64	IWAKUNI, JAPAN	N	80	X	60.70	SD	4.596	LT
D	11	64	IWAKUNI, JAPAN	N	80	X	65.92	SD	5.108	HT
D	12	64	IWAKUNI, JAPAN	N	104	X	50.90	SD	4.499	LT
D	12	64	IWAKUNI, JAPAN	N	104	X	55.20	SD	4.264	HT
D	01	65	IWAKUNI, JAPAN	N	114	X	46.03	SD	4.757	LT
D	01	65	IWAKUNI, JAPAN	N	114	X	51.25	SD	5.148	HT
D	02	65	IWAKUNI, JAPAN	N	103	X	43.53	SD	5.810	LT
D	02	65	IWAKUNI, JAPAN	N	103	X	50.85	SD	6.109	HT
D	03	65	IWAKUNI, JAPAN	N	109	X	44.91	SD	5.078	LT
D	03	65	IWAKUNI, JAPAN	N	109	X	52.88	SD	7.305	HT

TABLE 9. Minimum and Maximum Temperatures in Earth-Covered Storage, Monthly Summaries, MCAS, Iwakuni, Japan (Contd).

D	04	65	IWAKUNI,	JAPAN	N	55	X	50.18	SD	4.699	LT
D	04	65	IWAKUNI,	JAPAN	N	55	X	56.73	SD	7.240	HT
D	05	65	IWAKUNI,	JAPAN	N	81	X	57.63	SD	7.252	LT
D	05	65	IWAKUNI,	JAPAN	N	81	X	67.02	SD	8.601	HT
D	06	65	IWAKUNI,	JAPAN	N	132	X	65.52	SD	5.837	LT
D	06	65	IWAKUNI,	JAPAN	N	132	X	75.52	SD	8.408	HT
D	07	65	IWAKUNI,	JAPAN	N	61	X	71.34	SD	5.316	LT
D	07	65	IWAKUNI,	JAPAN	N	61	X	80.64	SD	6.208	HT
D	08	65	IWAKUNI,	JAPAN	N	117	X	71.26	SD	6.976	LT
D	08	65	IWAKUNI,	JAPAN	N	117	X	86.30	SD	7.177	HT
D	09	65	IWAKUNI,	JAPAN	N	90	X	72.00	SD	6.109	LT
D	09	65	IWAKUNI,	JAPAN	N	90	X	83.32	SD	7.500	HT
D	10	65	IWAKUNI,	JAPAN	N	41	X	68.20	SD	5.326	LT
D	10	65	IWAKUNI,	JAPAN	N	41	X	76.22	SD	4.993	HT
D	11	65	IWAKUNI,	JAPAN	N	51	X	60.82	SD	5.649	LT
D	11	65	IWAKUNI,	JAPAN	N	51	X	71.65	SD	6.711	HT
D	12	65	IWAKUNI,	JAPAN	N	42	X	46.02	SD	6.755	LT
D	12	65	IWAKUNI,	JAPAN	N	42	X	55.90	SD	5.695	HT
D	01	66	IWAKUNI,	JAPAN	N	36	X	44.25	SD	6.429	LT
D	01	66	IWAKUNI,	JAPAN	N	36	X	61.69	SD	8.786	HT
D	02	66	IWAKUNI,	JAPAN	N	53	X	42.40	SD	4.809	LT
D	02	66	IWAKUNI,	JAPAN	N	53	X	54.23	SD	8.721	HT
D	03	66	IWAKUNI,	JAPAN	N	55	X	47.25	SD	5.176	LT
D	03	66	IWAKUNI,	JAPAN	N	55	X	55.65	SD	6.096	HT
D	04	66	IWAKUNI,	JAPAN	N	26	X	47.81	SD	7.869	LT
D	04	66	IWAKUNI,	JAPAN	N	26	X	59.85	SD	7.821	HT
D	05	66	IWAKUNI,	JAPAN	N	66	X	60.45	SD	8.276	LT
D	05	66	IWAKUNI,	JAPAN	N	66	X	67.76	SD	6.209	HT
D	06	66	IWAKUNI,	JAPAN	N	48	X	67.00	SD	5.664	LT
D	06	66	IWAKUNI,	JAPAN	N	48	X	72.67	SD	4.309	HT
D	07	66	IWAKUNI,	JAPAN	N	55	X	70.16	SD	7.386	LT
D	07	66	IWAKUNI,	JAPAN	N	55	X	82.33	SD	9.475	HT
D	08	66	IWAKUNI,	JAPAN	N	60	X	76.23	SD	7.552	LT
D	08	66	IWAKUNI,	JAPAN	N	60	X	84.63	SD	7.059	HT
D	09	66	IWAKUNI,	JAPAN	N	105	X	76.57	SD	6.029	LT
D	09	66	IWAKUNI,	JAPAN	N	105	X	84.61	SD	6.835	HT
D	10	66	IWAKUNI,	JAPAN	N	83	X	67.60	SD	5.151	LT
D	10	66	IWAKUNI,	JAPAN	N	83	X	75.13	SD	6.366	HT
D	11	66	IWAKUNI,	JAPAN	N	82	X	59.44	SD	7.980	LT
D	11	66	IWAKUNI,	JAPAN	N	82	X	69.26	SD	5.960	HT
D	12	66	IWAKUNI,	JAPAN	N	84	X	48.17	SD	7.042	LT
D	12	66	IWAKUNI,	JAPAN	N	84	X	57.62	SD	6.109	HT

TABLE 10. Minimum and Maximum Temperatures in Non-Earth-Covered Storage, Monthly Summaries, MCAS, Iwakuni, Japan.

D	07	63	IWAKUNI,	JAPAN N	99	X	72.94	SD	5.658	LT
D	07	63	IWAKUNI,	JAPAN N	99	X	88.44	SD	7.163	HT
D	08	63	IWAKUNI,	JAPAN N	88	X	75.45	SD	4.661	LT
D	08	63	IWAKUNI,	JAPAN N	88	X	88.81	SD	6.456	HT
D	09	63	IWAKUNI,	JAPAN N	46	X	66.22	SD	8.443	LT
D	09	63	IWAKUNI,	JAPAN N	46	X	80.83	SD	8.136	HT
D	10	63	IWAKUNI,	JAPAN N	39	X	59.49	SD	9.673	LT
D	10	63	IWAKUNI,	JAPAN N	39	X	68.10	SD	7.229	HT
D	11	63	IWAKUNI,	JAPAN N	25	X	41.96	SD	6.393	LT
D	11	63	IWAKUNI,	JAPAN N	25	X	66.80	SD	4.463	HT
D	12	63	IWAKUNI,	JAPAN N	27	X	35.30	SD	6.776	LT
D	12	63	IWAKUNI,	JAPAN N	27	X	58.22	SD	5.528	HT
D	01	64	IWAKUNI,	JAPAN N	32	X	37.62	SD	8.717	LT
D	01	64	IWAKUNI,	JAPAN N	32	X	51.81	SD	4.822	HT
D	02	64	IWAKUNI,	JAPAN N	24	X	32.21	SD	6.827	LT
D	02	64	IWAKUNI,	JAPAN N	24	X	48.17	SD	5.806	HT
D	03	64	IWAKUNI,	JAPAN N	28	X	37.61	SD	6.691	LT
D	03	64	IWAKUNI,	JAPAN N	28	X	56.89	SD	5.776	HT
D	04	64	IWAKUNI,	JAPAN N	27	X	49.15	SD	7.020	LT
D	04	64	IWAKUNI,	JAPAN N	27	X	75.30	SD	7.760	HT
D	05	64	IWAKUNI,	JAPAN N	22	X	54.77	SD	6.604	LT
D	05	64	IWAKUNI,	JAPAN N	22	X	78.45	SD	7.608	HT
D	06	64	IWAKUNI,	JAPAN N	26	X	59.96	SD	5.896	LT
D	06	64	IWAKUNI,	JAPAN N	26	X	81.77	SD	5.264	HT
D	07	64	IWAKUNI,	JAPAN N	14	X	72.00	SD	7.147	LT
D	07	64	IWAKUNI,	JAPAN N	14	X	93.93	SD	5.076	HT
D	08	64	IWAKUNI,	JAPAN N	19	X	77.84	SD	5.326	LT
D	08	64	IWAKUNI,	JAPAN N	19	X	96.79	SD	6.941	HT
D	09	64	IWAKUNI,	JAPAN N	29	X	71.07	SD	6.969	LT
D	09	64	IWAKUNI,	JAPAN N	29	X	89.14	SD	5.055	HT
D	10	64	IWAKUNI,	JAPAN N	24	X	57.62	SD	6.226	LT
D	10	64	IWAKUNI,	JAPAN N	24	X	78.13	SD	5.636	HT
D	11	64	IWAKUNI,	JAPAN N	28	X	47.64	SD	6.601	LT
D	11	64	IWAKUNI,	JAPAN N	28	X	66.25	SD	5.797	HT
D	12	64	IWAKUNI,	JAPAN N	31	X	37.74	SD	6.361	LT
D	12	64	IWAKUNI,	JAPAN N	31	X	57.97	SD	7.744	HT
D	01	65	IWAKUNI,	JAPAN N	25	X	36.52	SD	7.709	LT
D	01	65	IWAKUNI,	JAPAN N	25	X	50.64	SD	6.921	HT
D	02	65	IWAKUNI,	JAPAN N	35	X	32.09	SD	6.206	LT
D	02	65	IWAKUNI,	JAPAN N	35	X	53.06	SD	8.221	HT
D	03	65	IWAKUNI,	JAPAN N	43	X	34.14	SD	7.133	LT
D	03	65	IWAKUNI,	JAPAN N	43	X	57.79	SD	5.285	HT

TABLE 10. Minimum and Maximum Temperatures in Non-Earth-Covered Storage, Monthly Summaries, MCAS, Iwakuni, Japan (Contd).

D	04	65	IWAKUNI,	JAPAN	N	23	X	36.04	SD	9.335	LT
D	04	65	IWAKUNI,	JAPAN	N	23	X	65.22	SD	5.728	HT
D	05	65	IWAKUNI,	JAPAN	N	19	X	49.16	SD	9.179	LT
D	05	65	IWAKUNI,	JAPAN	N	19	X	76.95	SD	6.087	HT
D	06	65	IWAKUNI,	JAPAN	N	38	X	63.71	SD	7.908	LT
D	06	65	IWAKUNI,	JAPAN	N	38	X	80.00	SD	6.678	HT
D	07	65	IWAKUNI,	JAPAN	N	20	X	77.80	SD	5.227	LT
D	07	65	IWAKUNI,	JAPAN	N	20	X	92.60	SD	5.995	HT
D	08	65	IWAKUNI,	JAPAN	N	49	X	65.65	SD	13.071	LT
D	08	65	IWAKUNI,	JAPAN	N	49	X	92.29	SD	6.696	HT
D	09	65	IWAKUNI,	JAPAN	N	42	X	60.98	SD	6.572	LT
D	09	65	IWAKUNI,	JAPAN	N	42	X	86.00	SD	8.451	HT
D	10	65	IWAKUNI,	JAPAN	N	22	X	52.05	SD	6.855	LT
D	10	65	IWAKUNI,	JAPAN	N	22	X	79.18	SD	5.586	HT
D	11	65	IWAKUNI,	JAPAN	N	25	X	50.04	SD	8.374	LT
D	11	65	IWAKUNI,	JAPAN	N	25	X	66.84	SD	9.711	HT
D	12	65	IWAKUNI,	JAPAN	N	21	X	30.57	SD	9.506	LT
D	12	65	IWAKUNI,	JAPAN	N	21	X	59.57	SD	5.437	HT
D	01	66	IWAKUNI,	JAPAN	N	24	X	32.46	SD	9.084	LT
D	01	66	IWAKUNI,	JAPAN	N	24	X	53.75	SD	9.119	HT
D	02	66	IWAKUNI,	JAPAN	N	21	X	27.57	SD	4.925	LT
D	02	66	IWAKUNI,	JAPAN	N	21	X	56.38	SD	7.533	HT
D	03	66	IWAKUNI,	JAPAN	N	26	X	36.69	SD	5.627	LT
D	03	66	IWAKUNI,	JAPAN	N	26	X	56.12	SD	6.095	HT
D	04	66	IWAKUNI,	JAPAN	N	12	X	40.42	SD	7.255	LT
D	04	66	IWAKUNI,	JAPAN	N	12	X	67.83	SD	7.120	HT
D	05	66	IWAKUNI,	JAPAN	N	26	X	63.23	SD	7.067	LT
D	05	66	IWAKUNI,	JAPAN	N	26	X	71.92	SD	3.888	HT
D	06	66	IWAKUNI,	JAPAN	N	16	X	68.62	SD	11.354	LT
D	06	66	IWAKUNI,	JAPAN	N	16	X	77.00	SD	4.367	HT
D	07	66	IWAKUNI,	JAPAN	N	18	X	67.28	SD	11.970	LT
D	07	66	IWAKUNI,	JAPAN	N	18	X	88.17	SD	4.866	HT
D	08	66	IWAKUNI,	JAPAN	N	18	X	77.00	SD	3.773	LT
D	08	66	IWAKUNI,	JAPAN	N	18	X	91.78	SD	4.722	HT
D	09	66	IWAKUNI,	JAPAN	N	30	X	69.57	SD	9.039	LT
D	09	66	IWAKUNI,	JAPAN	N	30	X	88.37	SD	6.189	HT
D	10	66	IWAKUNI,	JAPAN	N	24	X	59.21	SD	8.304	LT
D	10	66	IWAKUNI,	JAPAN	N	24	X	73.92	SD	3.550	HT
D	11	66	IWAKUNI,	JAPAN	N	24	X	46.79	SD	11.440	LT
D	11	66	IWAKUNI,	JAPAN	N	24	X	70.58	SD	4.242	HT
D	12	66	IWAKUNI,	JAPAN	N	24	X	34.46	SD	6.100	LT
D	12	66	IWAKUNI,	JAPAN	N	24	X	57.79	SD	7.144	HT

TABLE 11. Minimum and Maximum Temperatures in Earth-Covered Storage, Monthly Summaries, NAS, Atsugi, Japan.

D	03	65	ATSUGI	JAPAN	N	58	X	41.52	SD	4.740	LT
D	03	65	ATSUGI	JAPAN	N	58	X	49.31	SD	4.457	HT
D	04	65	ATSUGI	JAPAN	N	65	X	45.92	SD	4.071	LT
D	04	65	ATSUGI	JAPAN	N	65	X	54.35	SD	4.942	HT
D	05	65	ATSUGI	JAPAN	N	70	X	52.56	SD	5.558	LT
D	05	65	ATSUGI	JAPAN	N	70	X	61.50	SD	6.831	HT
D	06	65	ATSUGI	JAPAN	N	59	X	60.41	SD	3.970	LT
D	06	65	ATSUGI	JAPAN	N	59	X	66.95	SD	5.422	HT
D	07	65	ATSUGI	JAPAN	N	85	X	66.38	SD	3.681	LT
D	07	65	ATSUGI	JAPAN	N	85	X	71.92	SD	5.332	HT
D	08	65	ATSUGI	JAPAN	N	49	X	72.14	SD	3.109	LT
D	08	65	ATSUGI	JAPAN	N	49	X	78.02	SD	4.776	HT
D	09	65	ATSUGI	JAPAN	N	80	X	69.85	SD	3.822	LT
D	09	65	ATSUGI	JAPAN	N	80	X	75.25	SD	4.300	HT
D	10	65	ATSUGI	JAPAN	N	49	X	63.37	SD	3.757	LT
D	10	65	ATSUGI	JAPAN	N	49	X	67.94	SD	3.631	HT
D	11	65	ATSUGI	JAPAN	N	50	X	57.66	SD	4.457	LT
D	11	65	ATSUGI	JAPAN	N	50	X	64.42	SD	3.726	HT
D	12	65	ATSUGI	JAPAN	N	67	X	49.94	SD	4.917	LT
D	12	65	ATSUGI	JAPAN	N	67	X	54.31	SD	4.678	HT
D	01	66	ATSUGI	JAPAN	N	75	X	45.09	SD	6.267	LT
D	01	66	ATSUGI	JAPAN	N	75	X	50.79	SD	5.022	HT
D	02	66	ATSUGI	JAPAN	N	56	X	43.62	SD	4.591	LT
D	02	66	ATSUGI	JAPAN	N	56	X	51.59	SD	4.827	HT
D	03	66	ATSUGI	JAPAN	N	88	X	44.89	SD	3.593	LT
D	03	66	ATSUGI	JAPAN	N	88	X	53.55	SD	3.513	HT
D	04	66	ATSUGI	JAPAN	N	76	X	49.67	SD	3.991	LT
D	04	66	ATSUGI	JAPAN	N	76	X	56.20	SD	5.264	HT
D	05	66	ATSUGI	JAPAN	N	74	X	56.18	SD	3.049	LT
D	05	66	ATSUGI	JAPAN	N	74	X	63.35	SD	5.191	HT
D	06	66	ATSUGI	JAPAN	N	168	X	59.10	SD	3.917	LT
D	06	66	ATSUGI	JAPAN	N	168	X	65.95	SD	5.794	HT
D	07	66	ATSUGI	JAPAN	N	71	X	67.25	SD	4.318	LT
D	07	66	ATSUGI	JAPAN	N	71	X	72.59	SD	6.299	HT
D	08	66	ATSUGI	JAPAN	N	68	X	72.29	SD	4.617	LT
D	08	66	ATSUGI	JAPAN	N	68	X	77.13	SD	4.658	HT
D	09	66	ATSUGI	JAPAN	N	82	X	70.32	SD	3.617	LT
D	09	66	ATSUGI	JAPAN	N	82	X	76.56	SD	4.472	HT
D	10	66	ATSUGI	JAPAN	N	52	X	66.17	SD	2.763	LT
D	10	66	ATSUGI	JAPAN	N	52	X	70.25	SD	2.671	HT
D	11	66	ATSUGI	JAPAN	N	75	X	60.00	SD	6.301	LT
D	11	66	ATSUGI	JAPAN	N	75	X	66.41	SD	4.523	HT
D	12	66	ATSUGI	JAPAN	N	16	X	51.37	SD	7.932	LT
D	12	66	ATSUGI	JAPAN	N	16	X	62.69	SD	5.263	HT

TABLE 12. Minimum and Maximum Temperatures in Non-Earth-Covered Storage, Monthly Summaries, NAS, Atsugi, Japan.

D	06	61	ATSUGI	JAPAN	N	117	X	65.30	SD	5.481	LT
D	06	61	ATSUGI	JAPAN	N	117	X	78.18	SD	3.456	HT
D	07	61	ATSUGI	JAPAN	N	114	X	75.20	SD	2.286	LT
D	07	61	ATSUGI	JAPAN	N	114	X	86.73	SD	2.381	HT
D	08	61	ATSUGI	JAPAN	N	106	X	75.83	SD	3.468	LT
D	08	61	ATSUGI	JAPAN	N	106	X	86.52	SD	2.737	HT
D	09	61	ATSUGI	JAPAN	N	123	X	72.25	SD	3.505	LT
D	09	61	ATSUGI	JAPAN	N	123	X	85.16	SD	3.012	HT
D	10	61	ATSUGI	JAPAN	N	143	X	60.57	SD	5.019	LT
D	10	61	ATSUGI	JAPAN	N	143	X	74.78	SD	5.073	HT
D	11	61	ATSUGI	JAPAN	N	123	X	50.26	SD	6.100	LT
D	11	61	ATSUGI	JAPAN	N	123	X	65.73	SD	6.390	HT
D	12	61	ATSUGI	JAPAN	N	161	X	39.39	SD	4.626	LT
D	12	61	ATSUGI	JAPAN	N	161	X	55.08	SD	6.597	HT
D	01	62	ATSUGI	JAPAN	N	152	X	37.47	SD	5.166	LT
D	01	62	ATSUGI	JAPAN	N	152	X	48.84	SD	5.819	HT
D	02	62	ATSUGI	JAPAN	N	142	X	34.75	SD	3.284	LT
D	02	62	ATSUGI	JAPAN	N	142	X	52.76	SD	8.126	HT
D	03	62	ATSUGI	JAPAN	N	175	X	38.51	SD	4.294	LT
D	03	62	ATSUGI	JAPAN	N	175	X	55.19	SD	5.149	HT
D	04	62	ATSUGI	JAPAN	N	36	X	52.31	SD	6.458	LT
D	04	62	ATSUGI	JAPAN	N	36	X	67.75	SD	3.894	HT
D	05	62	ATSUGI	JAPAN	N	148	X	56.61	SD	3.432	LT
D	05	62	ATSUGI	JAPAN	N	148	X	70.67	SD	3.419	HT
D	06	62	ATSUGI	JAPAN	N	174	X	64.14	SD	2.398	LT
D	06	62	ATSUGI	JAPAN	N	174	X	75.41	SD	2.901	HT
D	07	62	ATSUGI	JAPAN	N	150	X	70.32	SD	4.897	LT
D	07	62	ATSUGI	JAPAN	N	150	X	80.60	SD	4.660	HT
D	08	62	ATSUGI	JAPAN	N	172	X	77.12	SD	2.235	LT
D	08	62	ATSUGI	JAPAN	N	172	X	87.35	SD	2.339	HT
D	09	62	ATSUGI	JAPAN	N	143	X	71.20	SD	6.063	LT
D	09	62	ATSUGI	JAPAN	N	143	X	83.80	SD	2.847	HT
D	10	62	ATSUGI	JAPAN	N	154	X	56.85	SD	4.845	LT
D	10	62	ATSUGI	JAPAN	N	154	X	72.06	SD	6.780	HT
D	11	62	ATSUGI	JAPAN	N	171	X	47.78	SD	6.618	LT
D	11	62	ATSUGI	JAPAN	N	171	X	61.11	SD	7.811	HT
D	12	62	ATSUGI	JAPAN	N	153	X	38.10	SD	2.225	LT
D	12	62	ATSUGI	JAPAN	N	153	X	52.66	SD	3.894	HT
D	01	63	ATSUGI	JAPAN	N	154	X	31.58	SD	3.492	LT
D	01	63	ATSUGI	JAPAN	N	154	X	47.76	SD	4.619	HT
D	02	63	ATSUGI	JAPAN	N	151	X	32.90	SD	3.500	LT
D	02	63	ATSUGI	JAPAN	N	151	X	48.12	SD	7.354	HT
D	03	63	ATSUGI	JAPAN	N	177	X	36.80	SD	5.107	LT

TABLE 12. Minimum and Maximum Temperatures in Non-Earth-Covered Storage, Monthly Summaries, NAS, Atsugi, Japan (Contd).

D	03	63	ATSUGI	JAPAN	N	177	X	54.01	SD	6.099	HT
D	04	63	ATSUGI	JAPAN	N	148	X	46.48	SD	4.258	LT
D	04	63	ATSUGI	JAPAN	N	148	X	66.30	SD	5.021	HT
D	05	63	ATSUGI	JAPAN	N	173	X	57.49	SD	5.463	LT
D	05	63	ATSUGI	JAPAN	N	173	X	71.20	SD	5.028	HT
D	06	63	ATSUGI	JAPAN	N	146	X	62.69	SD	8.214	LT
D	06	63	ATSUGI	JAPAN	N	146	X	75.79	SD	5.820	HT
D	07	63	ATSUGI	JAPAN	N	147	X	[illegible]	SD	3.702	LT
D	07	63	ATSUGI	JAPAN	N	147	X	84.41	SD	3.888	HT
D	08	63	ATSUGI	JAPAN	N	167	X	74.89	SD	2.277	LT
D	08	63	ATSUGI	JAPAN	N	167	X	86.47	SD	2.555	HT
D	09	63	ATSUGI	JAPAN	N	138	X	67.00	SD	5.497	LT
D	09	63	ATSUGI	JAPAN	N	138	X	78.25	SD	4.074	HT
D	10	63	ATSUGI	JAPAN	N	136	X	56.18	SD	4.992	LT
D	10	63	ATSUGI	JAPAN	N	136	X	72.13	SD	5.637	HT
D	11	63	ATSUGI	JAPAN	N	140	X	48.51	SD	7.018	LT
D	11	63	ATSUGI	JAPAN	N	140	X	65.49	SD	5.086	HT
D	12	63	ATSUGI	JAPAN	N	143	X	38.53	SD	6.381	LT
D	12	63	ATSUGI	JAPAN	N	143	X	56.44	SD	4.874	HT
D	01	64	ATSUGI	JAPAN	N	164	X	34.56	SD	3.986	LT
D	01	64	ATSUGI	JAPAN	N	164	X	49.97	SD	6.833	HT
D	02	64	ATSUGI	JAPAN	N	140	X	32.24	SD	4.817	LT
D	02	64	ATSUGI	JAPAN	N	140	X	46.31	SD	4.124	HT
D	03	64	ATSUGI	JAPAN	N	10	X	36.80	SD	5.473	LT
D	03	64	ATSUGI	JAPAN	N	10	X	47.50	SD	2.635	HT
D	03	65	ATSUGI	JAPAN	N	44	X	39.66	SD	4.345	LT
D	03	65	ATSUGI	JAPAN	N	44	X	53.45	SD	4.008	HT
D	04	65	ATSUGI	JAPAN	N	68	X	45.85	SD	4.296	LT
D	04	65	ATSUGI	JAPAN	N	68	X	63.43	SD	6.311	HT
D	05	65	ATSUGI	JAPAN	N	24	X	57.87	SD	6.002	LT
D	05	65	ATSUGI	JAPAN	N	24	X	69.75	SD	5.495	HT
D	06	65	ATSUGI	JAPAN	N	28	X	62.32	SD	5.525	LT
D	06	65	ATSUGI	JAPAN	N	28	X	77.68	SD	4.754	HT
D	07	65	ATSUGI	JAPAN	N	46	X	72.04	SD	4.055	LT
D	07	65	ATSUGI	JAPAN	N	46	X	83.60	SD	4.960	HT
D	08	65	ATSUGI	JAPAN	N	36	X	75.08	SD	6.456	LT
D	08	65	ATSUGI	JAPAN	N	36	X	89.00	SD	4.554	HT
D	09	65	ATSUGI	JAPAN	N	57	X	69.18	SD	4.343	LT
D	09	65	ATSUGI	JAPAN	N	57	X	81.42	SD	6.420	HT
D	10	65	ATSUGI	JAPAN	N	39	X	58.85	SD	5.687	LT
D	10	65	ATSUGI	JAPAN	N	39	X	72.41	SD	6.889	HT
D	11	65	ATSUGI	JAPAN	N	11	X	49.45	SD	6.517	LT

TABLE 12. Minimum and Maximum Temperatures in Non-Earth-Covered Storage, Monthly Summaries, NAS, Atsugi, Japan (Contd).

D	11	65	ATSUGI	JAPAN	N	11	X	66.36	SD	5.714	HT
D	12	65	ATSUGI	JAPAN	N	18	X	36.61	SD	4.118	LT
D	12	65	ATSUGI	JAPAN	N	18	X	51.94	SD	3.888	HT
D	01	66	ATSUGI	JAPAN	N	52	X	36.00	SD	5.636	LT
D	01	66	ATSUGI	JAPAN	N	52	X	49.93	SD	9.784	HT
D	02	66	ATSUGI	JAPAN	N	46	X	37.46	SD	4.395	LT
D	02	66	ATSUGI	JAPAN	N	46	X	55.00	SD	4.077	HT
D	03	66	ATSUGI	JAPAN	N	62	X	42.03	SD	5.291	LT
D	03	66	ATSUGI	JAPAN	N	62	X	60.66	SD	5.359	HT
D	04	66	ATSUGI	JAPAN	N	62	X	49.66	SD	5.506	LT
D	04	66	ATSUGI	JAPAN	N	62	X	67.05	SD	6.572	HT
D	05	66	ATSUGI	JAPAN	N	58	X	56.72	SD	4.719	LT
D	05	66	ATSUGI	JAPAN	N	58	X	73.29	SD	4.004	HT
D	06	66	ATSUGI	JAPAN	N	125	X	56.98	SD	8.149	LT
D	06	66	ATSUGI	JAPAN	N	125	X	75.02	SD	7.753	HT
D	07	66	ATSUGI	JAPAN	N	57	X	67.91	SD	10.098	LT
D	07	66	ATSUGI	JAPAN	N	57	X	80.98	SD	6.432	HT
D	08	66	ATSUGI	JAPAN	N	50	X	72.96	SD	8.478	LT
D	08	66	ATSUGI	JAPAN	N	50	X	86.90	SD	7.517	HT
D	09	66	ATSUGI	JAPAN	N	62	X	68.19	SD	7.384	LT
D	09	66	ATSUGI	JAPAN	N	62	X	84.90	SD	6.709	HT
D	10	66	ATSUGI	JAPAN	N	52	X	64.00	SD	5.851	LT
D	10	66	ATSUGI	JAPAN	N	52	X	77.88	SD	7.758	HT
D	11	66	ATSUGI	JAPAN	N	55	X	55.49	SD	11.410	LT
D	11	66	ATSUGI	JAPAN	N	55	X	72.51	SD	8.987	HT
D	12	66	ATSUGI	JAPAN	N	15	X	46.53	SD	12.194	LT
D	12	66	ATSUGI	JAPAN	N	15	X	68.87	SD	10.875	HT

TABLE 13. Minimum and Maximum Temperatures in Earth-Covered Storage, Monthly Summaries, NOF, Yokosuka, Japan.

D	01	66	YOKOSUKA	JAPAN	N	167	X	54.59	SD	3.311	LT
D	01	66	YOKOSUKA	JAPAN	N	167	X	58.17	SD	2.548	HT
D	02	66	YOKOSUKA	JAPAN	N	171	X	53.35	SD	4.129	LT
D	02	66	YOKOSUKA	JAPAN	N	171	X	57.43	SD	2.718	HT
D	03	66	YOKOSUKA	JAPAN	N	172	X	54.80	SD	2.742	LT
D	03	66	YOKOSUKA	JAPAN	N	172	X	58.17	SD	2.516	HT
D	04	66	YOKOSUKA	JAPAN	N	217	X	54.92	SD	2.494	LT
D	04	66	YOKOSUKA	JAPAN	N	217	X	58.24	SD	2.601	HT
D	05	66	YOKOSUKA	JAPAN	N	174	X	57.46	SD	2.192	LT
D	05	66	YOKOSUKA	JAPAN	N	174	X	61.03	SD	2.872	HT
D	06	66	YOKOSUKA	JAPAN	N	176	X	58.85	SD	2.146	LT
D	06	66	YOKOSUKA	JAPAN	N	176	X	62.45	SD	2.906	HT
D	07	66	YOKOSUKA	JAPAN	N	183	X	59.97	SD	6.415	LT
D	07	66	YOKOSUKA	JAPAN	N	183	X	65.75	SD	5.392	HT
D	08	66	YOKOSUKA	JAPAN	N	112	X	63.69	SD	4.226	LT
D	08	66	YOKOSUKA	JAPAN	N	112	X	66.64	SD	6.009	HT
D	09	66	YOKOSUKA	JAPAN	N	140	X	63.44	SD	3.462	LT
D	09	66	YOKOSUKA	JAPAN	N	140	X	66.49	SD	6.112	HT
D	10	66	YOKOSUKA	JAPAN	N	115	X	61.67	SD	3.568	LT
D	10	66	YOKOSUKA	JAPAN	N	115	X	64.45	SD	3.912	HT
D	11	66	YOKOSUKA	JAPAN	N	105	X	59.64	SD	2.978	LT
D	11	66	YOKOSUKA	JAPAN	N	105	X	63.46	SD	3.760	HT
D	12	66	YOKOSUKA	JAPAN	N	147	X	56.53	SD	5.307	LT
D	12	66	YOKOSUKA	JAPAN	N	147	X	59.57	SD	3.474	HT

TABLE 14. Minimum and Maximum Temperatures in Non-Earth-Covered Storage, Monthly Summaries, NOF, Yokosuka, Japan.

D	01	66	YOKOSUKA	JAPAN	N	56	X	35.05	SD	6.303	LT
D	01	66	YOKOSUKA	JAPAN	N	56	X	50.39	SD	4.716	HT
D	02	66	YOKOSUKA	JAPAN	N	55	X	38.73	SD	6.513	LT
D	02	66	YOKOSUKA	JAPAN	N	55	X	54.60	SD	4.783	HT
D	03	66	YOKOSUKA	JAPAN	N	56	X	42.93	SD	3.898	LT
D	03	66	YOKOSUKA	JAPAN	N	56	X	59.27	SD	6.280	HT
D	04	66	YOKOSUKA	JAPAN	N	70	X	48.87	SD	4.380	LT
D	04	66	YOKOSUKA	JAPAN	N	70	X	61.23	SD	5.441	HT
D	05	66	YOKOSUKA	JAPAN	N	56	X	56.14	SD	3.863	LT
D	05	66	YOKOSUKA	JAPAN	N	56	X	70.89	SD	4.709	HT
D	06	66	YOKOSUKA	JAPAN	N	59	X	59.19	SD	5.319	LT
D	06	66	YOKOSUKA	JAPAN	N	59	X	75.46	SD	6.548	HT
D	07	66	YOKOSUKA	JAPAN	N	84	X	68.37	SD	6.940	LT
D	07	66	YOKOSUKA	JAPAN	N	84	X	81.36	SD	6.001	HT
D	08	66	YOKOSUKA	JAPAN	N	71	X	75.86	SD	3.395	LT
D	08	66	YOKOSUKA	JAPAN	N	71	X	85.54	SD	6.605	HT
D	09	66	YOKOSUKA	JAPAN	N	90	X	71.17	SD	5.174	LT
D	09	66	YOKOSUKA	JAPAN	N	90	X	81.58	SD	6.135	HT
D	10	66	YOKOSUKA	JAPAN	N	72	X	62.97	SD	4.466	LT
D	10	66	YOKOSUKA	JAPAN	N	72	X	71.69	SD	5.006	HT
D	11	66	YOKOSUKA	JAPAN	N	66	X	53.32	SD	6.776	LT
D	11	66	YOKOSUKA	JAPAN	N	66	X	65.94	SD	4.883	HT
D	12	66	YOKOSUKA	JAPAN	N	90	X	41.68	SD	6.590	LT
D	12	66	YOKOSUKA	JAPAN	N	90	X	53.82	SD	6.412	HT

Appendix D

STATISTICAL NOTES AND IMPLICATIONS

The following points concerning the data should be considered before making final judgement on the contents of this report.

(1) The time intervals at which temperature readings were taken were not equal. The maximum and minimum temperature readings were those encountered within the magazine during those intervals of time. The difference in reading-time intervals biases the results in both maximum and minimum directions. It has been found that the temperatures in some magazines were read daily, weekly, biweekly, or monthly, or less frequently, depending on the material and procedures cogent to each facility. This, of course, biases the results upward as a high temperature for one day may be the recorded temperature for that magazine for a one-week or greater period, instead of for that specific day.

(2) The amount of ammunition in the storage magazines is not always constant. The absorption of heat by the ammunition (dependent on the quantity of material) within the magazine could cause differences in temperature readings that are not accounted for.

(3) The frequency at which the magazine doors are opened will also influence the temperature readings. This effect is also not accounted for.

(4) The Data Summary indicating the number of maximum temperature readings exceeding nominal temperatures is exclusive of minimum temperature readings. Perhaps the minimum temperatures could be used in such a way as to provide the length of time which these nominal temperatures are exceeded. If, for example, the minimum temperature recorded for a reading interval is 90°F, it is certain that the temperature within the storage magazine was no lower than 90°F during that reading interval.

The number of data points, the averages, and the standard deviations of temperature readings for each month was reported in Appendix C because these statistics provide information concerning the distribution of temperature readings. If it is assumed that these temperature measurements are normally distributed (the Gaussian curve) within each month, and the data in most cases does not indicate that it is a poor assumption for practical use, the standard deviation can be used to attach probabilities of occurrences to nominal temperature values. For example, in July 1966, for non-earth-covered magazines at the Marine Corps Air Station, Iwakuni, Japan, the sample size is 18; the average high temperature is 88.17°F, and the standard deviation is

4.886°F (Table 10). From this and the assumption that the data is representative of the storage temperatures encountered in July, the probability of getting a storage temperature of 110°F or greater is essentially zero. In rare cases, the distribution of the temperature data from a given location does not appear to be normal due to a very few extraordinarily high temperatures. This phenomena will give the plotted data a lopsided or "skewed" appearance, and it results in the statistical estimate of the highest attainable temperature being too high. This could be remedied with a larger sample size. However, the method being discussed is still reasonably valid. If this method is applied to storage temperature means (x) and standard deviations (SD) (See Appendix C) from other months from all facilities, it would be found that reaching a temperature of 115°F for earth-covered magazines or 120°F for non-earth-covered magazines is unlikely.

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Storage magazine temperature measurements (32,548 data points) from Okinawa and Japan are under study. This data collection is for the purpose of establishing a temperature criterion by statistical methods for ordnance stored in explosive hazard magazines.

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